

ALASKA LEGISLATURE COMMITTEE FILES 1993-1994 8672

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equipment purchases, additions to equipment value have risen dramatically. With trends in all prices up sharply, future equipment purchases will buy less than in the past. The continued demands for purchase of more costly equipment compounds the problem.

Higher education's current overall funding for plant additions provides some perspective on the magnitude of funding required for plant renewal and replacement. Spending for 1986 and 1987 and projections for 1988-90: plant additions were represented by 62% for new construction and 12% for additions; and 26% was spent on modernizations.

Case Studies

The lack of a detailed recent national survey frustrates responses to funding sources for comparisons of renewal needs. Congress and State legislators want more than a general estimate of renewal need. Hard data is demanded to justify the claims for campus facility renewal. At the campus level, responses can be prepared from detailed condition surveys. Rigorously prepared and creatively presented, surveys have proven effective in securing funding.

A number of state systems of higher education have documented the magnitude of their capital renewal and deferred maintenance:

1. **New York.** A 1982 survey of public and private institutions with 1.02 million students and 196 million GSF reported 20% of space was in an unsatisfactory condition.
2. **North Carolina.** A 1982 facilities inventory of public and private institutions with 228,000 students and 72 million GSF reported 17.4% of space was unsatisfactory. The estimated costs of restoring to satisfactory condition was \$301 million.
3. **California.** A detailed survey of the University of California system in 1983 determined that 60 million GSF of space had a capital maintenance backlog of \$2 billion at \$33.60 per square foot.
4. **Texas.** A 1982 survey of 25 institutions of the College and University System Coordinating Board (which excludes the University of Texas and Texas A. & M.) evaluated conditions of educational and general facilities ten years and older. Total costs of renewal and replacements for 21.3 GSF were estimated at \$301 million.
5. **Maryland.** In 1985, a report was presented to the Maryland Board of Regents for the eight campuses of the University of Maryland. Critical needs were defined for a five-year period totalling \$555.5 million: \$224 million to correct deteriorated facility conditions and \$331.4 million for new facilities. The 1986 allocation for deferred maintenance was \$2.5 million, despite an estimated annual renewal need of \$22.5 million.

Several independent campuses have documented the magnitude of their capital renewal and deferred maintenance, with costs ranging from \$15 to \$40/sq. ft.:

1. **Columbia University.** A 1984 survey of 7.1 million GSF of space estimated a capital maintenance backlog of \$247 million. Average costs were \$34.80 per GSF.
2. **Syracuse University.** A deferred maintenance program conducted from 1972 to 1985 for 7.1 million GSF totaled \$250 million in current dollars.
3. **University "T".** A midwestern University of 15,000 students completed a comprehensive survey of facility conditions in 1988. A total gross square foot area of 6.26 million GSF was estimated to have a replacement value of \$626,000,000. Deferred maintenance was estimated at \$134,666,005 -- 21.5 percent of the total replacement value. Of this total, \$32.5 million was in "urgent" needs.

Summary

The estimate of 20 percent of current replacement value in unsatisfactory condition provides a useful guideline for overall national facility conditions. However, campus administrators and trustees do not require a national survey to tell them that their campuses need capital renewal. They can see and hear it first hand from faculty, staff, students, and alumni. Prospective students and donors also convey the message by admissions applications and contributions.

The importance of facility appearance to student recruitment is underscored by the study of the Carnegie Foundation for the Advancement of Teaching⁴ on how students choose a college. For 62 per cent of the students, "appearance of the buildings and grounds was the most influential factor during a campus visit".

Capital renewal and deferred maintenance needs vary by region, building type, the extent of use and abuse, and quality of original construction and facilities management. Levels of current fund allocation for operations and maintenance, special appropriations for a capital renewal also affect funding needs. But, as sure as death and taxes, building systems and components deteriorate and need replacement. Plumbing wears out, roofing breaks down and leaks, window frames warp, patched up electrical wiring becomes dangerous, HVAC systems fail to heat and cool, and equipment can no longer be replaced.

4. Boyer, Ernest L. College: The Undergraduate Experience in America. New York: The Carnegie Foundation for the Advancement of Teaching (1987).

These are glamorless priorities. Capital renewal of deteriorated facilities in competition with academic program improvements, acquisition of technological advances in computing and other equipment, and improvements in campus life facilities, will remain a low priority unless aggressive action is taken by facilities managers.

FACILITY CONDITION INDEX

$$FCI = \frac{DM \text{ TOTAL}}{\text{PLANT REPLACEMENT TOTAL}}$$

$$FCI < 5\% = \text{GOOD}$$

$$FCI \ 5-10\% = \text{FAIR}$$

$$FCI > 10\% = \text{POOR}$$

Chapter Four. ESTIMATING CAPITAL RENEWAL FUNDING REQUIREMENTS

An effective capital renewal and deferred maintenance reduction program requires reliable estimates of funding requirements and thorough planning. A successful program should estimate funding needs in the following categories:

- Long-term capital renewal needs
- Estimates of short-term programs for reduction of deferred maintenance backlogs to acceptable levels

Long- and short-term needs should be identified concurrently for an organization is to achieve desired goals for minimal deferred maintenance and a capital renewal program. This approach recognizes that: (1) facilities conditions continually deteriorate over time and require ongoing investments to maintain functional and financial value; and (2) historical facility underfunding problems must be addressed through a short-term remedial program of deferred maintenance reduction.

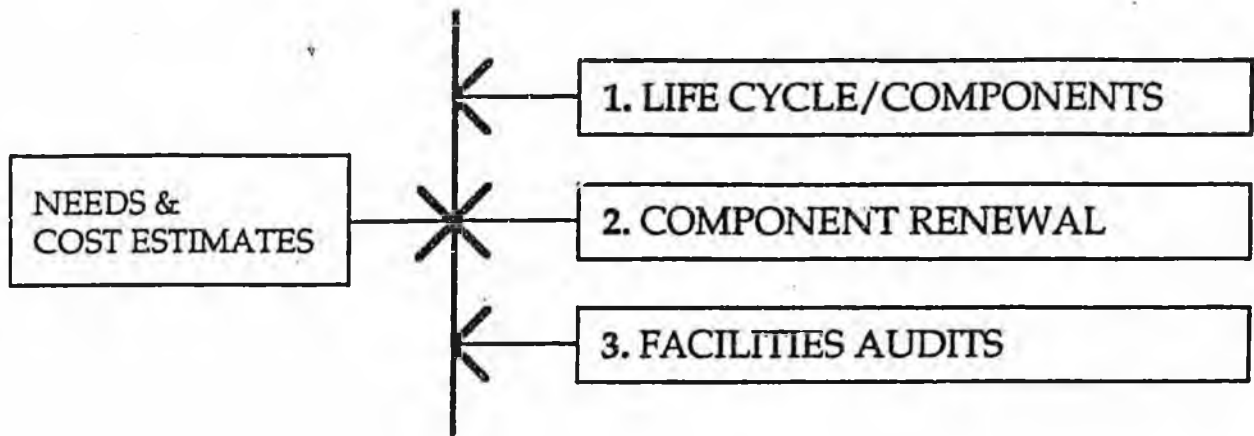
Selecting the appropriate method (Figure 3) requires an understanding of an organization's fiscal planning, needs and available resources for estimating. The goal is to provide an adequate, realistic budget reserve for allocating funds for specific projects. As projects are identified, funds are set aside and expended as required.

Life Cycle Method

Funding for long-term capital renewal needs can be provided by an annual renewal allowance may be estimated based on life cycle formulas using sum-of-the-digits calculations. The principle involved in this method is that facilities renewal needs increase as a facility ages. For example, an organization with an average building age of fifty years has greater renewal needs than one of twenty years. As a result, formulas for annual renewal allowances must be weighted to compensate for age difference of facilities.

A simple straight-line projection of a building with a fifty-year life declines at the rate of two percent a year. Although a crude rule of thumb, this approach would require that two percent of a building's current replacement value be set aside each year. Because buildings are made up of components and systems that age at differing rates, adjustments are made in formulas to compensate for these factors.

FIGURE 3
ESTIMATING CAPITAL RENEWAL AND DEFERRED MAINTENANCE NEEDS



1. LIFE CYCLE / COMPONENTS

$$\text{ANNUAL RENEWAL ALLOWANCE} = \frac{(f) \text{ Current Replacement Value} \times \text{Building Age}}{\text{Sum of Digits @ 50 years} = 1275}$$

Sum of Digits Formula

2. RENEWAL INDEX

$$\text{Building Component Value} \times \text{Life Cycle} = \text{RENEWAL INDEX}$$

*P-25
FIG 5*

3. FACILITIES AUDIT

Total Deficiency Costs

Sum-of-the-Digits Method

The typical life cycle formula using the sum-of-the-digits method can be used to make these adjustments. For example, a facility with an expected fifty year life cycle is "aged" so that at the end of fifty years, it reaches its full replacement value equal to the building age divided by 1275 (where 1275 equals the sum of $1+2+3+4+\dots+49+50 = 1275$). Thus, instead of generating a constant of two percent of its current renewal value for fifty years, a building will generate almost four percent a year ($50/1275$) of its current value. In this way, groups of older buildings require more renewal funds than a similar group of newer buildings.

Additional adjustment factors can be used in allowance formulas to compensate for a building portion of to be renewed at the end of its life and for renovations that have modified a facility's life. These factors assume that at the end of a building's life, 2/3, 3/4, or 100 percent of the building value (BV) requires replacement. An example of a life cycle formula for an annual renewal allowance is shown in Figure 4.

Factors used in the calculation are: the building age and current replacement value for an existing facility; or the estimated total project cost for a completed facility.

This technique can be estimated manually or by computer spreadsheet for each building. A compilation of such calculations for all buildings or facilities will produce an annual renewal allowance. The renewal allowance represents a pool of funds to be allocated for individual projects, performed in order of priority.

An alternate to the sum-of-the-digits method "ages" each major component of a building to determine an annual renewal allowance. Empirical studies using this method produce a range of 1.5 to 3 percent of current replacement value. This figure serves as a useful guideline in estimating an overall budget for annual capital renewal.

Estimating long-term renewal funding requirements using empirical data for building component renewal cycles develops a Component Renewal Index. The underlying concept is that building components age at different rates, requiring different renewal cycles. The following assumptions are made in developing this estimating approach:

1. Average useful life of a building is 100 years
2. Buildings are comprised of components that deteriorate at predictable periodic intervals during the life of a building

*1.5% = 12 million / 800
SPENT
MORE NEEDED*

Component Renewal Method

FIGURE 4
LIFE CYCLE FORMULA

Annual Renewal Allowance = $2/3 \text{ BV} \times \text{BA} / 1275$, where:

- Annual Renewal Allowance = the funding which should be allocated annually
- $2/3$ = The building renewal constant for an assumed replacement
- BV = The building value determined by updating the original construction cost to a current replacement value
- BA = The building age as corrected for either partial or total building renewal
- 1275 = The age-weighting constant based on a fifty-year life

Example:

An unrenovated building constructed in 1965 at a cost of \$1,000,000 has a current replacement value (1989) of \$3.1 million:

$$\begin{aligned}
 \text{Annual Allowance} &= 2/3 \text{ BV} \times \text{BA} / 1275 \\
 \text{1989 Allowance} &= 2/3 \$3,100,000 \times 24 / 1275 \\
 &= \$2,067,000 \times 0.01882 \\
 &= \$38,901
 \end{aligned}$$

Handwritten notes:
 $3,100,000$
 $2,067,000 = 3,100,000 \times 0.67$
 $38,901 = 2,067,000 \times 0.01882$

Handwritten note: $24 = 100\%$

3. Not all components experience 100% renewal. Component renewal occurs if 50% or more of the component requires replacement
4. There are different types of construction for each component, with different materials, different renewal costs, and different useful lives.
5. buildings must be categorized by type and usage to allow for different proportions and complexities of components.
6. In accordance with the "law of large numbers," the average costs for component removal and construction in various accepted publications are assumed to be adequate for this purpose, on the condition that careful attention is given to how the costs are applied.
7. Long-term planning is facilitated by using five-year increments for component renewal projections. This guideline is based on two assumptions: it is more reasonable to predict a five-year term in which a component will fail than to attempt to predict the exact year; and there is some degree of flexibility in scheduling the component renewals.

This approach uses life cycles for renewing building components and systems to produce a component renewal index. The index is expressed as a per cent value equivalent to the portion of a facility that must be replaced annually and includes the following factors:

- **Facility Type** - subsystems and associated costs vary widely across the range of building types.
- **Date of Construction** - original date of construction and date of major additions and renovations affect renewal funding needs.
- **Facility Subsystems** - quantity and quality of installed subsystems within a facility will determine replacement requirements.
- **Subsystem Life Cycles** - predictable life of a subsystem will determine when future replacement requirements will occur.
- **Subsystem Cost** - unit replacement cost for subsystems affect future requirements.

A component renewal index for the purposes of computing an annual renewal allowance for a facility uses the following steps:

1. Define building systems
2. Estimate system costs
3. Calculate system percentage of total construction
4. Estimate life cycle system cost
5. Calculate renewal index

A sample calculation of a renewal index for a low-rise (1-4) story office building is shown in Figure 5 and follows the steps outlined below:

Step One - Define Building Systems

The building components outlined in Column One (Figure 5) are those

FIGURE 5
RENEWAL INDEX FOR A ONE TO FOUR STORY OFFICE BUILDING

<u>Column 1</u> BUILDING COMPONENT	<u>Column 2</u> Cost per Gross Square Feet	<u>Column 3</u> Per Cent of Total Construction	<u>Column 4</u> Average Year Before Replacement Value	<u>Column 5</u> Renewal Index= % per Year of Total Value
1. Foundations	\$1.18	2.25%	100	.023
2. Substructure	.85	1.61	100	.016
3. Superstructure	5.73	10.90	100	.109
4. Exterior Closure	5.22	9.93	50	.199
5. Roofing	.90	1.71	15	.114
6. Int. Construction	11.88	22.61	20	1.130
7. Conveying	1.99	3.79	25	.152
8. Mechanical	8.74	16.63	25	.665
9. Electrical	6.22	11.84	40	.296
10. Equipment	-	-	-	-
11. Spec. Construction	-	-	-	-
12. Sitework	-	-	-	-
Subtotal	\$42.71			
Gen Conditions (15%)	\$6.41	12.20		
Arch Fees (7%)	<u>\$3.43</u>	<u>6.53</u>		
Total Building Cost	\$52.55	100.00%		
Renewal Index (Percent of Replacement Value)			=	270

Component Renewal Index

1. DEF. BLDG SYS

2. EST COST & % CONSTRUCTION

3. EST. SYST. LIFE CYCLE

4. CALC REN INDEX

used in MEANS SQUARE FOOT COSTS for a similar building type. A uniform listing of building components should be used for consistency in the factors for developing replacement indexes for various building types.

Steps Two and Three - Estimate System Costs and System Percent of Total Construction

Building component costs are obtained from MEANS SQUARE FOOT COSTS for a similar building type. The percent of total construction is calculated by dividing the cost of each component into total project cost.

Step Four - Estimate System Life Cycle

Various sources provide the average number of years before renewal or major repairs are required to estimate the life of a component. A secondary set of calculations may be required for a facility with a major renovation.

Step Five - Calculate Renewal Index

The final step in the calculation is to divide the per cent of total construction (Column 3 in Figure 5) by the replacement life (Column 4) to produce a renewal index for each component (Column 5). The total of the component indexes results in a renewal index or annual renewal allowance of 2.70 per cent of the current replacement value of the building. Remember, this is a sample calculation and each building will require a separate calculation from comparative data for a similar building type.

Analyses using this procedure can be performed for different building types and a summary replacement index can be developed for an institution's facilities. This final amount provides a guide for annual capital budgeting of renewal needs.

SUMMARY

Life cycle formulas and component renewal methods of calculating renewal needs provide usable estimates for planning purposes. Data bases are necessary for component life cycle, building histories, and current replacement values. A more detailed approach providing extensive documentation of conditions is the facilities audit described in the next chapter.

Chapter Five.

FACILITIES AUDITS

Routine questions asked of the facilities manager are: What are the conditions of our facilities? Do we face a significant deferred maintenance problem? How much will be needed to correct the problem? How do we plan a capital renewal program?

The facilities audit provides a source for identifying the existing physical condition and functional performance of buildings and infrastructure, as well as its maintenance deficiencies. From the information gathered during this audit, capital renewal and replacement requirements can be estimated for individual projects and annual forecasts. The facilities audit provides a basis for decision-making on routine maintenance, capital renewal/deferred maintenance, functional improvements, replacements, and disposal of an institution's facilities. Use of the audit as a process of inspecting building and infrastructure conditions guides maintenance management and prioritizing projects for capital budgeting.

Purpose of a Facilities Audit

The facilities audit systematically and routinely identifies building and infrastructure deficiencies and functional performance of campus facilities by an inspection program and reporting of observations. The audit process assists maintenance management and the institution's decision-makers by recommending actions for major maintenance and capital renewal.

The audit is designed for use by facilities managers responsible for maintenance, capital renewal, and capital budgeting. Circumstances may differ between institutions that undertake a comprehensive survey of all facilities for the first time, or those that have a specific set of goals for determining existing conditions. The basic principles presented here can be used for all levels of institutions, from a single structure to a facility consisting of multiple building complexes in dispersed locations. A continuous process of facilities audits, beyond a one-time program, provides up-to-date major maintenance priorities and can generate a significant portion of routine maintenance workloads. An effective audit program will extend the useful life of facilities, reduce disruptions in use of space or equipment down-time, and improve facilities management relations with facilities users.

Audit Structure

The audit is a process of collecting information on current conditions of a facility. Goals and objectives of a well-designed audit are to:

- provide for a routine inspection of all facilities identifying deficiencies
- define regular maintenance requirements
- define capital renewal and replacement projects in order to eliminate deferred maintenance
- develop cost estimates to correct deficiencies
- restore functionally obsolete facilities to a usable condition
- eliminate conditions that are either potentially damaging to property or present life safety hazards
- identify energy conservation measures
- inventory accessibility and disabled persons requirements

The basic phases of the audit process are shown in Figure 6. The first three phases - designing the audit, collecting data, and summarizing results - provide the data base on maintenance deficiencies and functional performance. This is followed by presentation of findings. In this systematic approach the scope of the audit is first determined, audit team selected, and inspection planned. Next, data is collected through inspection of buildings and infrastructure and functional performance evaluations. Finally, the information from these inspections and evaluations is summarized, priorities set, and results presented.

Uses of the Audit

The audit is a method of collecting information on the current maintenance conditions and functional performance of a facility. It is designed to include:

- inventory of facilities, providing descriptions of characteristics
- inspections of existing buildings and infrastructure conditions
- evaluations of functional performance
- recommendations for correcting observed deficiencies.

The inspection process is accomplished by systematic inspections of buildings and infrastructure by components following the sequence of construction. Functional performance is evaluated for future planning purposes, capital renewal and replacements. The methodology can be implemented directly or adapted to meet special conditions and needs of an institution without being rigidly followed in all aspects.

FIGURE 7
BUILDING COMPONENT DESCRIPTIONS

Primary Systems

1. Foundation and Substructure

Footings

Foundation Walls

Insulation

Slab on grade

Grade Beams

Waterproofing and Underdrain

2. Structural System

Floor system

Structural framing system

Platforms and Walkways

Roof system

Pre-engineered buildings

Stairs

3. Exterior Wall System

Exterior walls

Exterior doors and frames

Chimneys and exhaust stacks

Exterior windows

Entrances

4. Roof System

Roofing

Flashings, expansion joints, and
 gravel stops

Gutters and downspouts

Insulation

Roof hatches, smoke hatches, and skylights

Secondary Systems

5. Ceiling System

Exposed structural systems

Suspended systems

Directly applied

6. Floor Covering System

Floor finishes

7. Interior Wall & Partition Systems

Interior walls

Interior doors and frames

Toilet partitions

Interior windows

Hardware

Special openings: access panels, shutters, etc.

8. Specialities (Examples)

Bathroom accessories

Laboratory equipment

Signage

Waste handling

Kitchen equipment

Projection screens

Telephone enclosures

Window coverings

FIGURE 7 (cont.)

Service Systems

9. Heating, Ventilating, and Cooling

- | | |
|-----------------------------|-------------------------|
| Boilers | Radiation |
| Solar heating | Ductwork and piping |
| Fans | Heat pump |
| Fan coil units | Air handling units |
| Packaged rooftop A./C units | Packaged water chillers |
| Cooling tower | Computer room cooling |

10. Plumbing System

- | | |
|---------------------------|--------------------|
| Piping, valves, and traps | Controls |
| Pumps | Water storage |
| Plumbing fixtures | Drinking fountains |
| Sprinkler systems | |

11. Electrical Service

- | | |
|----------------------------------|----------------------|
| Underground and overhead service | Duct bank |
| Conduits | Cable trays |
| Underfloor raceways | Cables and bus ducts |
| Switchgear | Switchboard |
| Substations | Panelboards |
| Transformers | |

12. Electrical Lighting

- | | |
|-------------------------|-----------------------------|
| Lighting fixtures | Wiring |
| Motor controls | Motors |
| Safety switches | Telecommunications and data |
| Emergency/standby power | Baseboard electric heat |
| Lightning protection | |

13. Conveying Systems

- | | |
|-------------------------|---------------------------|
| Dumbwaiters | Elevators |
| Escalators | Material handling systems |
| Moving stairs and walks | Pneumatic tube systems |
| Vertical conveyors | |

14. Other Systems

- | | |
|-------------------------|------------------|
| Energy control systems* | Clock systems |
| Public address systems | Sound systems |
| TV systems | Satellite dishes |
| Communications networks | |

FIGURE 6
FACILITIES AUDIT PHASES

PHASE ONE

- Designing the Audit
- determine audit scope
 - select audit team
 - plan inspections

PHASE TWO

- Collecting Data
- prepare inspection forms
 - conduct inspections
 - prepare inspection reports
 - prepare functional performance evaluations

PHASE THREE

- Summarizing Results
- evaluate inspections
 - prepare summary reports
 - computerizing audits
 - future audits

PHASE FOUR

- Presenting Findings
- communications
 - format
 - presentation design
 - gaining support
 - putting the audit to work

*NOTIFY OCCUPANTS
PROCEDURE TO
ADDRESS EMERGENCIES*

If an audit is designed in a comprehensive, easy-to-use format, it can be used:

- in the field without extensive training
- with or without consultant assistance
- at any location, regardless of size

Condition Inspections

Condition inspections are designed to provide a record of deficiencies and estimated costs for corrective measures. The *deficiency-cost* methodology requires training of inspectors for a "self-audit" (or clear instructions to consultants) conducting the audit for an objective and consistent data base for future reference. Incorporated into the training is the development of a style of operation in facilities management that is a process of continually observing and reporting deficiencies, flowing results into maintenance work and capital budgeting and planning. A successful audit program will introduce a culture of observing and reporting conditions, not on a one-time basis, but as a regular part of supervisory and trades people work performance.

The condition inspection part of a facilities audit is a visual inspection of buildings and infrastructure systems and components. Design of the inspection forms and methodology is based on how a building or infrastructure is constructed and how inspectors would logically proceed to make observations and collect data for deficiencies and costs of corrective measures. Building inspections begin with how a structure is placed in the ground, then travelling upwards to structural framing, exterior wall enclosures, and roof, and moving to the interiors. Each service system - HVAC, plumbing, electrical - is treated separately. A comprehensive audit provides an inspection of architectural, civil/structural, mechanical, electrical, and safety components of each facility. Infrastructure inspections are conducted in a similar manner.

Figure 7 outlines the systems and components for building and infrastructure inspections. References used for developing this outline are the R.S. Means Company, Inc. Means Graphic Construction Standards and Means Cost Data (Annual Editions). The reader may refer to these publications for an understanding of alternative component definitions and cost data for estimating costs of correcting deficiencies.

Data collection for buildings is divided into four major systems and fifteen components. Primary systems include foundations, structural system, exterior wall system, and roofing system. Secondary systems includes interior work that make the facility usable, e.g., floors, ceilings, interior walls and partitions, and specialities. Service

FIGURE 7 (cont.)

Safety Standards

15. Safety Standards

Asbestos

Egress: travel distance, exits, etc.

Extinguishing and suppression

Disabled accessibility**

Hazardous/toxic material storage

Code Compliance

Fire ratings

Detection and alarm systems

Emergency lighting

* Energy Audit

** Disabled Accessibility Audit

INFRASTRUCTURE COMPONENT DESCRIPTIONS

1. Site Work

Roads

Parking Lots *of HEAC PLOT OUTLOTS*

Fencing

Walks

Curbing

Water retention

2. Site Improvements

Landscaping

Furniture: benches, bike racks, waste receptacles, kiosks, signage

Lighting

3. Structures

Bridges

Retaining walls

Culverts

Tunnels

4. Utilities

Central energy plants

Compressed air

Domestic water

Energy monitoring and control

Irrigation

Storm drainage

Wastewater treatment and collection

Chilled water distribution

Distilled water

Electrical distribution

Fire protection

Steam distribution

Sanitary sewage

Water treatment and distribution

systems describes all operating systems, such as HVAC, electrical, and plumbing systems. Safety standards, including life safety and code compliance, are grouped together. Decisions on where to record data for a unique system or alternatives to the component definitions should be flexible and decided in the initial organization of the audit and instructions to inspectors.

Major infrastructure components are listed groupings that can be inspected by appropriate specialized staff or consultants. These components should also be reviewed and flexibility retained until a final list is adopted.

Functional Performance Evaluations

Completing the data base with an analyses of facilities functional characteristics provides a useful tool for renovation or planning alternative uses of facilities. Prior to summarizing the results of the condition inspection functional performance of a facility - suitability, adaptability and use considerations - should be considered.

For example, in the condition inspections, a building may have significant deficiencies with costs of corrective measures exceeding replacement value. However, for historic, esthetic reasons or other policies, a facility may be retained for remodeling and extended use. Decisions to undertake major renovations resulting from functional performance evaluation can lead to including all identified priorities in a single improvement program. A facility also may be considered for remodeling, but the institution may want to recommend demolition or sale because of conflicts with other plans for future land use or as a source of revenues.

Planning the Inspection

Thorough planning of the building and infrastructure component inspections is essential to a successful audit program producing accurate, timely, and useful results. There are several critical factors to be considered in planning inspections.

Scope of Audit

Specific buildings, infrastructure, systems, and components should be defined to assure that inspections satisfy the audit's goals and objectives.

Scheduling Inspections

An overall timetable for inspecting facilities translates goals and objectives into a framework for individual buildings and infrastructure. A specific budget cycle may be the driving force; strategic planning

with a need for financial and physical resource components can also be the impetus for a facilities audit. The level of staff effort or need to retain consultants is determined by:

- the overall inspection timetable
- number of facilities, size, age, and type to be inspected
- staff availability
- facilities access influenced by usage and seasonal weather
- information available on the facilities
- nature and extent of involvement with key building personnel, especially research staff

An ideal audit program inspects all buildings and infrastructure components on an annual basis for budget planning and keeping surveys of deferred maintenance current. Resource limitations may not make this goal possible. An initial audit should cover all facilities, regardless of resources, and maintained on a cycle of at least two to five years. The initial audit can be extended over several years by inspecting some facilities each year; inspections are a continuous process, not a one-time activity. An audit program on a continuing basis should become a fundamental activity of plant operations and maintenance, generating a large share of annual maintenance workload and providing an accurate listing of capital renewal projects. Managing the flow of audit information into maintenance work orders and capital renewal/deferred maintenance planning should also be considered for the ability to process and implement inspection data.

The final step in scheduling inspections is estimating required time for each facility. Each discipline involved should be considered, along with preparation of drawings, facility access, and pertinent operating and maintenance information. Include enough time for preliminary discussions with building occupants or a survey soliciting information on conditions. The primary use of a facility will determine the time required for an inspection. Guidelines for an inspection timetable are described in Managing the Facilities Portfolio, derived from Department of Navy standards (NAVFAC Manual MO-322, Inspection for Maintenance of Public Works and Public Utilities). Approximately equal time will be required for conducting inspections and preparing inspection reports.

Responsibility

The inspection process, whether conducted by in-house staff, consultants, or a combination of both requires designation of an audit manager for overall responsibility. The importance of this task is emphasized by allocating the majority of the manager's time to the assignment. The manager maintains control of the audit process by

establishing the position as the primary contact in facilities management for the inspection teams. Procedures should be established by the manager to inform building managers and the business office of the inspection schedule and guidelines for inspectors. The audit manager also develops and supervises training for the inspectors, prepares the inspection schedule, assigns audit team members, monitors progress, and reports audit findings and recommendations.

Information Requirements for Inspections

Planning the inspections includes developing an information base for each facility to be inspected. The audit manager is responsible for assembling information and supervising a central location serving as audit headquarters containing files, equipment and access to copying machines and computers. The following is a suggested listing for an inspection information base:

- facilities inventory
- building file
- maps with grids
- building plans
- infrastructure plans
- project list and status of renovations, additions, and capital renewal
- maintenance cycles: preventive, painting, equipment replacement
- inspection report information: priority criteria, craft codes, labor rates, and estimating sources
- codes and other regulatory requirements
- building contacts: coordinators, managers, etc.
- access: keys, restricted areas, and safety precautions for hazardous conditions
- testing services: procedures for any specialized testing or laboratory services

Inspection Assignments

In-house inspectors are assigned building or infrastructure systems and components by the audit team manager. Disciplines should be matched with the inspection assignment. For example, primary systems inspectors can be a team with architectural and civil engineering skills. It is preferable to have two or more staff members inspecting a facility together for safety reasons and improving communications between inspectors in identifying and diagnosing problems, selecting priority classifications, and cost estimating.

Training

Orientation of in-house inspectors and consultants on the inspection's purpose, schedule, and use of the forms is essential to assure uniform and

accurate results. Knowing why, when, and how the audit is to be conducted contributes to the quality of inspection results and develops interest and enthusiasm for incorporating inspections and reporting of maintenance deficiencies as a regular part of plant activities. Recognize that staff may consider the audit an additional burden to their normal assignments. The leadership of facilities management and the audit manager should impress on the inspectors the importance of their tasks and the contribution to the overall organization's operations.

Objectivity in conducting inspections should be emphasized during training for its critical importance. Conscientious staff, naturally protective of their areas of responsibility, should be encouraged to reduce subjectivity in conducting inspections. When consultants are scheduled for inspections, they should be sensitive to in-house staff during the process of critically identifying conditions.

Well-prepared training sessions in the use of the inspection forms assists in completing a successful audit program, guiding the thoroughness of an inspection, and reporting results. Team members should be encouraged to share inspection results with other audit team members and question maintenance personnel for any known building or infrastructure deficiencies. They should also be regularly informed of any management actions resulting from the audit; annual reports, or other summaries. A training program can include:

- purpose of the audit
- availability of information
- inspector's responsibilities
- maintenance standards
- health, safety, and building codes
- field notes, camera and video recorder use
- use of forms
- describing deficiencies
- estimating maintenance and capital renewal
- use of results

Tools and Equipment

An efficiently performed inspection requires inspectors to be prepared for a day in the field without returning to the base of operations unnecessarily. To assure that the inspector is well-prepared for assignments, a checklist of tools and equipment includes:

- Floor plans
- Tape measure
- Adjustable wrench
- Knife
- Report forms
- Screwdriver
- Flashlight

- Portable tape recorder (optional)
- Camera with flash (optional)

Notification to building occupants

Building occupants or users of infrastructure must be notified of a scheduled inspection. A preliminary discussion with users or a survey soliciting information can identify many problems before performing the inspection. Access to the building or any planned service disruptions for testing should be coordinated to avoid interrupting normal facilities operations. Tours of a building with occupants is useful to uncover deficiencies and considering corrective measures. Care should be taken to avoid inferring that inspections and identification of deficiencies will result in a specific program of remedial actions. Inspection results should be shared with building managers and any management actions on maintenance or capital renewal.

Emergency Work

Procedures for remedying any emergency conditions observed during the inspection assure prompt corrective action. Audit team members should be instructed in these procedures during training.

Inspection Report Forms

Collecting data for the Facilities Audit in the deficiency-cost methodology uses a standard inspection form that is completed for each of the suggested fifteen building and four infrastructure components outlined in Figure 7. The design of a standard form shown in Figure 8 provides a consistency to the inspection process, enabling modifications to the number or terminology of components. **PREPARE AND CAREFULLY REVIEW THESE FORMS. THEY ARE THE CORE OF THE INSPECTION PROGRAM.**

The actual inspection is preceded by preparation of the form(s) by the audit manager and orientation of the inspectors. Each component form is organized with Part 1 completed by the audit manager. The checklist for information, inspection tools and equipment, notification to building occupants, access arrangements, and safety procedures is reviewed at this time. Any questions by inspectors on making field notes, noting deficiencies on drawings, recording observations by camera or video recorder, and completing the forms should be discussed at this time. The inspectors should clearly understand the inspection schedule, and the two-stage inspection process: (1) conducting the field inspection and recording field observations; and (2) preparing a report of the observations.

the inspection. The outlines should be reviewed to determine if this is consistent with the purposes of the audit. Because the audit is conducted for determining conditions and corrective actions, following or modifying the forms should be carefully considered before beginning inspections. A review by the audit manager and members of the inspection team is recommended as part of orientation for the inspection.

A sample inspection report (Figure 9) shows the three parts completed. The upper part of the form (1. Facility/Inspection Data), identifies the facility, component to be inspected, the inspector's name and date of inspection. The middle part of the form (2. System Description) provides a brief component description. The lower part of the form (3. Component Evaluation) numbers and describes each deficiency, assigns a priority rating, and indicates the corrective measures required to remedy the deficiency. A floor plan (Figure 8) keys the location of the deficiencies reported in the sample inspection form (Figure 9).

The following explains the entries on the sample inspection report form:

1. FACILITY INSPECTION DATA

FACILITY # and FACILITY NAME - This information is obtained from the Building File.

COMPONENT# and COMPONENT NAME - This information is obtained from the outline of Building Component Descriptions (Figure 7).

INSPECTOR NAME and DATE - The full name of the inspector and the date of the inspection.

2. COMPONENT DESCRIPTION

The component is described referring to the component name entered in part 1 of the report form and made specific to include the component elements listed in Figure 7. For example, 1. Foundation walls, waterproofing, and insulation.

3. COMPONENT EVALUATION

Deficiency and corrective measures are reported in this section of the form. Data entries are:

Deficiency # - A number is assigned in sequence for each deficiency, used as a reference in deficiency summary reports and identifying the location of a deficiency on a floor plan or map.

Deficiency Description - Each deficiency is briefly described and a

FIGURE 9

FACILITY AUDIT INSPECTION REPORT

1. FACILITY INSPECTION DATA

FACILITY: # M-4 NAME LABORATORY BUILDING

COMPONENT: # 5,6,7 NAME CEILING/FLOORS/INTERIOR WALLS & PARTITIONS

INSPECTOR: H.A. MORGAN DATE: 10/5/92

2. COMPONENT DESCRIPTION: SUSPENDED CEILING SYSTEMS;
FLOOR FINISHES; INTERIOR WALLS & PARTITIONS; INTERIOR DOORS & FRAMES;
HARDWARE; SPECIAL OPENINGS; MILLWORK

3. COMPONENT EVALUATION:

Deficiency Def #	Description	Priority Rating	Corrective Measures		
			Craft	Labor \$	Mat'l \$ Total Cost
1.	Moisture on interior wall surfaces *Check brick masonry separating from back-up walls	1	XX	(Structural inspection required)	
2.	Replace defective door closers @ 4 stairways	1	CA	\$400	\$125 = \$2,100
3.	Repair masonry joints in mechanical room wall	2	MA	\$300	\$50 = \$350
4.	Remove & replace stained ceiling tiles *check roof for leaks	3	CA	\$120	\$100 = \$220
5.	Replace window seals on west wall	2	CA	\$1,420	\$1,800 = \$3,220
6.	Remove & replace worn corridor carpeting	3	XX	-	- \$2,400
TOTAL					\$8,240

Conducting the Inspection

Building and infrastructure inspections provide observations of conditions to be summarized on inspection report forms for individual components. The inspection thoroughly examines the component and documents all deficiencies requiring corrective measures. In a deficiency-cost audit, the inspector has the responsibility to record deficiencies, assign a priority, and estimate the cost for corrective measures.

During the inspection, inspectors should use the component form as a guide in making field notes of observations describing the deficiency and defining corrective measures. Photographs or video recordings can supplement the inspector's field notes when preparing the report. Drawings of building floor plans or infrastructure installations should be noted to locate the deficiency. Each deficiency is assigned a sequential number corresponding to the written description, designating it on the drawing and providing a reference for job planning and future audits. Any inaccurate information on the component description should be noted and corrected in the information base. Conditions observed by inspectors requiring testing or specialized inspection skills, such as removal of material or inspecting hidden conditions, should be identified for follow-up work.

After field work is completed, the inspection report form is prepared. Report preparation following field work enables the inspector to compare notes with other members of the audit, request any specialized testing, and consult resources available for estimating costs of corrective measures.

Preparing the Inspection Report

The facilities condition inspection report is based on building or infrastructure forms for recording field observations of deficiencies and corrective actions. All of the information gathered in field notes during an inspection is summarized on individual component forms designed for use in inspecting building and infrastructure components and can be adapted for special conditions or unique facilities. The inspection form is the basic information-collecting instrument, requiring a simple process of organization before issuance to inspectors. The form is designed so that it can generate data for a variety of summaries and is easily adapted to simple word processing or spread sheet formats.

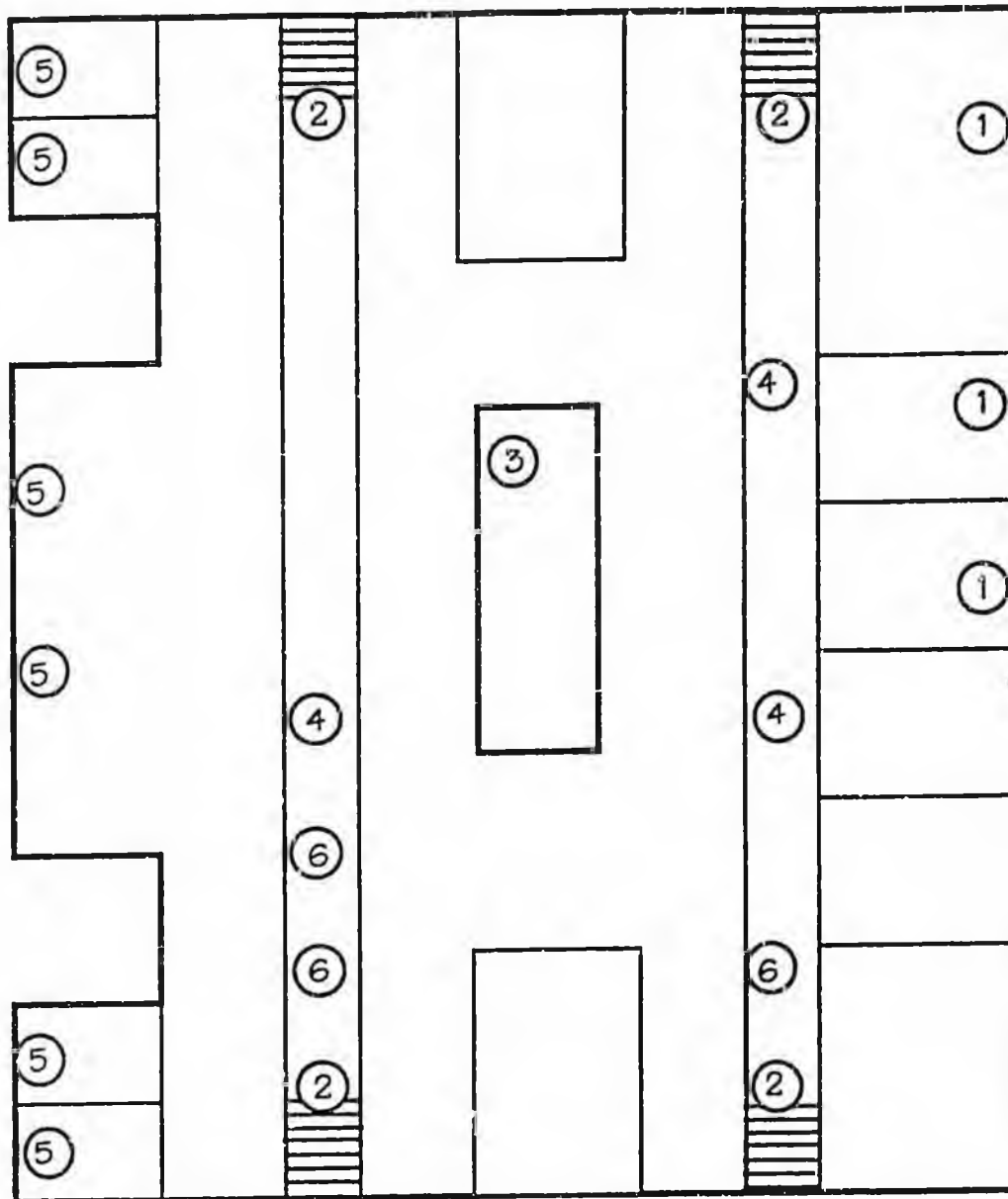
In the preparation for the inspection, the audit manager identifies the components to be inspected and assembles a set of inspection report forms. The outlines of Building Component and Infrastructure Descriptions (Figure 7) guides selection of components to be included in

FIGURE 10

DEFICIENCY LOCATION

FACILITY: # 4
INSPECTOR: HARRY MORGAN
COMPONENT: 5,6,7
LOCATION: 2d FLOOR

NAME: LABORATORY BUILDING
DATE: 10/5/92
COMPONENT: CEILINGS; FLOORS; INTERIOR WALLS & PARTITIONS



corrective repair or replacement action specified. Standard construction and maintenance terminology should be used. Remember, this is not a lengthy description of the problem but concentrates on the recommended corrective action. For example, "Replace deteriorated foundation wall insulation, northeast corner."

Priority Rating - A priority rating system is based on the importance of taking the necessary corrective action. An important piece information required for maintenance and capital renewal planning is when the repair should be accomplished, leading towards recommended funding requirements. Priority rating systems sort out relative importance, such as life safety, preventing loss of a component, system or an entire facility, legal or code requirements, energy conservation or other cost-effective projects, or projects that can be delayed for a period of time. A suggested priority outline is shown in Figure 11.

A "triage" approach should be followed in the inspection, sorting out items for immediate action and implementation through a work order system. This approach builds the inspection concept into the regular daily work routine of supervisory and trades people and develops habits for recording and reporting building and infrastructure deficiencies. A useful checklist for the "triage" approach flowing work into a work order system includes:

1. Life Safety /property loss
2. Preventive maintenance (PM)
3. Minor Maintenance (upper cost limits set by the institution)
4. Code requirements
5. Major Maintenance (cost range defined by the institution)
6. Capital renewal and/or replacement (projects defined by the institution)
7. Appearance
8. Americans with Disability Act Compliance

A recommended priority system uses numbers representing a five year planning cycle - 1 to 5 - with 1 the first year of priority and on to 5 for the last year of the cycle. Each year's inspection introduces new deficiencies and the priority listing is revised accordingly.

Opportunities should be examined to group projects of different priorities for economies of scale or use of similar trades and equipment. Buildings or infrastructure planned for renovation or major repairs should include all priorities. in this case, lower priorities are not deferred to later years.

Craft - Who should do the work is indicated by a craft classification for in-house work or a symbol for contractor work. Trade or shop classifications should be numbered in sequence or use recognizable two-digit symbols. For example, carpentry work can be identified as CA or a

FIGURE 11
PRIORITY CRITERIA

Priority 1

Urgent needs to be completed within one year, correcting a safety problem, eliminating damaging deterioration, or complying with environmental or other codes.

Priority 2

Potentially urgent deficiencies which, if not corrected within two years, will become urgent needs. Short-term cost payback projects to reduce operating costs can be included at this priority level or raised to the highest level, if funds are available.

Priority 3 - 5

Deficiencies that are not potentially urgent but, if deferred longer than 3 to 5 years, will affect use of a facility or cause significant damage to a facility. Signs of deterioration in roofing are an example of this priority. Deficiencies identified in inspections that are esthetic improvements, usually done on a routine schedule should be inspected for problems to determine the critical need for a higher priority.

two digit code, e.g. 01. Contractor use is determined by availability of in-house staff, capabilities to perform the work, or an established project cost limit and identified by letter or number code, e.g., CA or XX. Estimated Cost - Costs of in-house work includes labor, materials, and overhead. Schedules of trades staff hourly rates, including overhead, should be available for inspectors when transferring field notes to inspection reports. Material costs can be obtained from department, local vendors, or estimating sources, such as Means Estimating Cost Data (R.S. Means Company, Inc.). Use of cost estimating information should be select data for repairs and renovations and not new construction. Contractor costs are entered as only Total Costs and should not include labor and materials. Estimates may be provided by in-house estimators or informational quotes from contractors. Including labor and materials may be erroneously included for in-house budgeting of labor or material and should be avoided. The Total Cost should be escalated for inflation when prioritized for future years and the rate of inflation noted.

Preparing the Functional Performance Evaluation

A comprehensive audit includes an evaluation of building functional performance. Questions addressed in the functional performance evaluation are: how suitable is the building for its current use? how adaptable is it for alternative uses?; and, what factors affect future uses? The purpose of providing this information is to guide prioritization of renewal/deferred maintenance projects with a background of present and future use considerations.

Responses to these questions are in narrative form, requiring a comprehensive knowledge of buildings' present use, the total space inventory, and the overall institutional master plan. Functional performance evaluations are not normally done by maintenance staff. The facilities audit manager should refer these questions to the campus facilities planning officer or other knowledgeable staff.

Functional performance is reported on two forms, illustrated in Figures 12 and 13. Together, these forms evaluate the suitability of a building for its present use and provide an invaluable reference for studies for future uses. The assignability of space is analyzed for future use, and various qualitative conditions such as traditional, historic, aesthetic, community, or other intangible values.

Decisions on project priorities can be affected by information available from the functional performance evaluation. Inadequacies of a building to meet its current requirements, or have limited adaptability for future

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FIGURE 12
FUNCTIONAL PERFORMANCE - SUTABILITY AND ADAPTABILITY

1. FACILITY INSPECTION DATA

FACILITY # _____ FACILITY NAME _____

INSPECTOR _____ DATE _____

2. COMPONENT DESCRIPTION

a. Flexible Design Concept _____

b. Partitions (Demountable or Rigid) _____

c. Specialized Building Type _____

d. Flexible Service Systems _____

e. Stationary Equipment _____

f. Functional Spaces _____

g. Working Environment _____

h. Circulation and Functional Relationships _____

i. Conflicting Uses _____

j. Code Conformance _____

k. Disabled Accessibility _____

l. Deferred Maintenance _____

3. COMMENTS _____

FIGURE 13
FUNCTIONAL PERFORMANCE - USE CONSIDERATIONS

1. FACILITY INSPECTION DATA

FACILITY # _____ FACILITY NAME _____

INSPECTOR _____ DATE _____

2. COMPONENT DESCRIPTION

- a. Traditional Values Significant role or meaning relative to practices or values.
- b. Historic Values Significance to the institution or community for historic associations similar to National Register of Historic Places criteria.
- c. Esthetic Values Visual qualities and physical relationships with other buildings or the landscape.
- d. Social/Community Values Benefits or detriments to location and/or community.
- e. Interim Use Facility can be used temporarily for other uses.
- f. Future Land Use Conflicting land use with future plans.
- g. Suitability Spatial characteristics relative to specific use or is suitable for highly specialized use difficult to replace.
- h. Intangible Values Orientation, psychological environment, noise, odors, etc.

3. COMMENTS _____

uses, may have already designated it for renovation or replacement. In this case, projects would be identified and deferred until final decisions reached on the facilities future.

Evaluation of use considerations, providing comments on factors affecting a facilities potential, can identify critical issues of a campus planning nature. Replacement or retention may be conclusion for a structure, impacting location of future buildings. Functional performance is also useful in examining some of the negative aspects of facility suitability, such as conflicting land use, visual and physical arrangement problems, conflicts, and attitudes detrimental to the institution in future planning.

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Putting the Audit Audit to Work

The facilities audit is a process of collecting information on building and infrastructure conditions and reporting results of inspections. The process enables facilities managers to develop a data base that is essential for maintenance management, capital renewal, and deferred maintenance reduction programs. An initial audit may require external assistance. Managing the inventory of conditions is the responsibility of the facilities manager.

Putting the audit to work means developing an ethic among maintenance staff to continually inspect, observe and report deficiencies, and maintain a timely and accurate record of facilities conditions. It also means developing funding alternatives, procedures for managing funding, and assuring that current use of resources is effective and efficient.

The facilities audit process provides the basis for determining capital needs to avoid future facilities deterioration. This enables development of short- and long-term needs for dealing with the problem. The audit process also supports assessment of comparative facilities conditions and development of priorities. Too often, at this point, the process ends with frustrations due to unresponsiveness to funding requests. What many systems and institutions lack is a project prioritization process; a resource allocation model to formulate funding planning; and a will to change the campus culture in favor of capital asset renewal. Although there are an increasing number of successful examples, the evidence of national surveys shows that the rate of facilities deterioration continues to increase. Despite a weak national economy and financial distress in higher education, the problem must be faced sooner than later.

Capital Renewal Planning

Capital renewal planning is a continuous process, beginning with a preliminary plan and evolving into a final plan adjusted on an annual basis. A preliminary plan for capital renewal resource allocation defines the overall goals for short-term needs for deferred maintenance and long-term needs for life cycle renewal of facilities components. Such a plan, guiding the shifting of facilities from marginal to a desirable level of conditions, is influenced by an institution's mission and strategic plan. These factors have become increasingly important as declining resources have affected restructuring, resulting in downsizing, shifts in emphasis from research to undergraduate teaching, and residential life. Thus, a resource allocation model for capital renewal is an integral part of an overall strategic plan.

The process of developing a preliminary plan includes:

- Project prioritization
- Rate of annual capital reinvestment
- Duration of a deferred maintenance reduction program

A final capital renewal plan evolves from fitting a funding model to a selected rate of capital reinvestment that balances a desired amount of expenditures over a period of time with the duration of reducing deferred maintenance backlog. The result is a coordinated program for capital renewal and maintenance designed to protect capital assets, a funding plan, and monitoring of the program.

Resource Allocation

How much to spend on capital renewal is guided by the results of an audit and the total cost of prioritized projects. Questions to be posed for

Chapter Six SELECTION OF PRIORITIES

Setting Priorities

The facilities audit will furnish two types of information to senior administrators and other decision makers who need to set facilities priorities. First, those facilities that have the greatest need based on the severity of both physical conditions and functional performance can be selected; second, the audit results will help plan maintenance tasks and capital project budgeting.

Priority selections from the facilities audit can be made for several purposes. Maintenance work orders, maintenance projects, and capital projects can be estimated and scheduled for work assignment. Management priority decisions on operating and capital budgets are supported by the facilities audit information.

Maintenance Deficiency Estimates

Maintenance deficiency comments entered on the Component Inspection Forms can be estimated, preferably using quantities of labor and materials, design fees, and other owner's costs. General estimates of costs from similar projects are not specific enough to determine priorities. Reliable sources should be used.

Where staff is available, their experience with maintenance and similar projects is vital for estimating projects. Architects, contractors, vendors, and special consultants should be retained for assistance in preparing estimates where necessary.

Priorities by Character of Work

Categorization of priorities requires consistent treatment of deficiencies noted in the audit and functional improvement requests, since funding decisions are made based on these categories. Categorizing involves separating capital projects from maintenance work orders or maintenance projects, estimating project requests, and then summarizing project requests for a five-year budgeting cycle. Funding priorities are based on a systematic categorization, developing a plan for funding maintenance and capital projects from operating budgets or special funding allocations for capital projects.

An outline for ranking priorities by point values is shown in Figure 14. Three priority levels are described which can be interpreted from the Component Rating Forms and maintenance deficiency comments. The audit team manager adds his or her knowledge of overall plant

FIGURE 14
PROJECT PRIORITY LEVELS

	Point Value
PRIORITY LEVEL I	
I-1 <u>Life Safety and Legal Compliance</u>	10
a. Hazardous life safety building or site conditions that jeopardize people, programs, equipment; unless corrected will cause suspension of facilities use.	
b. Repairs, renovation, and improvements required for immediate compliance with local, state, and federal regulations.	
II-2 <u>Damage or Deterioration to Facilities</u>	9
Repairs, renovations, and improvements to facilities that unless corrected, will lead to a loss of a facility.	
III-3 <u>Cost Effective Measures</u>	8
a. Repairs, renovations, and improvements required to prevent serious facility deterioration and significantly higher labor costs if not immediately corrected.	
b. Energy conservation to reduce consumption with a rapid return on investment.	
PRIORITY LEVEL II	
II-1 <u>Mission Support</u>	7
Actions required to support functional activities.	
II-2 <u>Delayed Priority I</u>	6
Repairs and renovations less compelling than Priority I.	
II-3 <u>Deferred Maintenance</u>	5
Deferral of repairs or renovations which will lead to major damage to a facility and loss of use, hamper program activities, or affect economies of operation.	
PRIORITY LEVEL III	
III-1 <u>Project Completion</u>	4
Building or site improvements uncompleted because of inadequate funding or other reasons. Improvements are necessary for proper functioning, economic maintenance, and suitable appearance of new construction.	
III-2 <u>Delayed Deferred Maintenance</u>	3
Repairs, renovations and improvements that can be postponed.	
III-3 <u>Anticipating Actions</u>	2
Actions carried out in anticipation of longer range development including land acquisition, infrastructure elements, and advance planning for capital projects.	
III-4 <u>Reduction in Scope</u>	1
Modify scope to a smaller scale or consolidate with other project.	

resource allocation are: (1) What are the effects of different amounts of annual expenditures for capital reinvestment on total backlog reduction?; and (2) What is a desirable rate of annual expenditures for reducing marginal facilities conditions. Restated, this could be posed as: How will "X" dollars for some years reduce a backlog of deficiencies at the end of the period? Or, How much must be spent to reach a desired level of conditions for all campus facilities over a certain number of years? Key variables are the capital reinvestment rate and the backlog targets. Factored into decisions in both cases are the inflation rate, the rate of plant deterioration, and the backlog deterioration rate.

A method of comparing facilities conditions, based on a ratio of facilities deficiencies to current replacement value (CRV), is useful in setting annual funding targets and the duration of deferred maintenance reduction.

$$\text{Facility Condition Index (FCI)} = \frac{\text{deficiencies}}{\text{current replacement value}}$$

The FCI uses empirical data to benchmark relative measures of conditions on campuses:

FCI < 5% (.05)	= Good condition
FCI = 5-10% (.05-.10)	= Fair condition
FCI > 10% (.10)	= Poor condition

For example, after conducting an inspection of buildings and infrastructure a campus with 3.5 million GSF finds it has \$60 million in deferred maintenance. At an average CRV of \$100/GSF (\$350,000,000), the FCI is .171, an indication of "poor" conditions.

A facilities audit's information on deficiencies provides the source for estimating short- and long-term capital needs, in terms of a deferred maintenance reduction program and a component renewal program. Component renewal, based on life cycle of component's is necessary to prevent future deferred maintenance backlogs.

Costs obtained from an audit for correcting facilities deficiencies and a calculation of the CRV allows modelling of the variables for annual and total funding needs and the rate of backlog reduction. For example, if only 1% of the CRV is available, the change in the FCI can be calculated. Or, a determination to achieve an FCI of 5% in 10 years can produce a calculation of annual capital renewal needs.

A rule of thumb for the annual reinvestment rate is 1.5% to 3.0% of CRV. However, experience is showing a preference for the upper end of the range (2.5% to 3.0%) as necessary to prevent further accumulation of a deferred maintenance backlog. This is separate from funding required to eliminate immediate critical needs of deferred maintenance. A capital renewal plan must include funding for the two factors of deferred maintenance backlog reduction and component renewal. This concept is fundamental to capital renewal funding planning.

Summary

A campuses' awareness that inadequate capital renewal funding has created a set of deteriorating plant conditions should lead to a facilities audit. The results of the audit produces a list of capital and maintenance projects that can be funded to improve plant conditions. As needs are reduced to manageable amounts, the operating budget can accommodate priorities as they are identified. The end result is a program that maintains facilities in good repair, efficient to operate and maintain, and functionally adequate for an organization's mission.

conditions. Careful judgement is necessary in choosing the priorities to fit with strategic planning and other policy considerations.

Another scheme of selecting priorities using broad descriptive categories are grouped to assist in determining priorities. Suggested categories are described and listed below.

1. **Liability Proposals:** Special matters requiring early attention to remove jeopardy through life safety, property damage, regulatory, or court ordered actions which represent liability proposals.
2. **Program and Operational Purposes:** Actions necessary to support an organization's mission and meet operational requirements are grouped under this category.
3. **Economy and Efficiency Measures –** Projects which also support program and operational objectives, but deserve special attention because they will result in immediate or eventual cost savings, are categorized as economy and efficiency measures.

Separate Priority Lists

Separate priority lists can be developed from the deficiency reports entered on the Component Rating Forms to fit budgeting practices of the operations and maintenance department and decisions by the facility manager. This preference is determined by the different funding sources available for maintenance work orders, maintenance projects, and capital projects. The cost ranges of deficiency categories can be adjusted by type of work.

In making a review of all projects, opportunities should be analyzed to "package" several projects for economies of scale. For example, roofing repairs and replacements for several buildings are commonly grouped together into a single project to allow for lower unit pricing. Similar operations, such as erecting scaffolding or suspending use of portions of buildings, also lend themselves to cost efficiencies and minimize building use inconveniences.

Intangible Factors

There are other factors which do not readily lend themselves to categories but should be considered when making funding decisions. Staff morale makes a positive contribution to overall productivity and can be influenced by sufficient space and properly functioning, well-furnished and equipped, attractive and well-maintained facilities. Staff recruitment and retention is similarly affected by the physical appearance of facilities and the architectural qualities of buildings and site aesthetics. Accordingly, historic preservation is an emerging factor affecting priorities. Facilities in a marginal condition

considered for replacement may be more valuable if retained and improved because of their importance to historic continuity or as a focal point for a community.

Organizing these categories and intangible factors into a specific set of selection guidelines enables decisions based on technical evaluations and an organization's requirements.

Management Philosophy

Two concepts influencing final priority decisions are need and risk. For example, are projects for improving quality of the environment selected before life safety or operating economy projects?

In the final analysis, selection of priorities by management is the relative weight given to:

- the protection of plant assets;
- possible fiscal instability caused by postponing deferred maintenance or energy conservation measures;
- the visual image of the institution;
- the risk of erosion of function and quality of environment.

Although these matters may seem relatively intangible, they can be as debilitating as the more obvious physical consequences of deferring high priority building and site repairs.

Capital Budget Review Committee

Minimizing the vicissitudes of the budget process can be handled by a Capital Budget Review Committee, including the campus chief executive officer, chief academic and business officers, and the facilities administrator. Monitoring of progress on major maintenance and capital renewal should be done by the Committee on a quarterly basis. This schedule permits a routine opportunity for introducing emergencies and new priorities and offers enhanced management of institutional cash flow. Reports provided by the facility administrator should summarize status of authorized and funded projects and lists of proposed projects for the following budget year. An additional report summarizing anticipated projects for a "rolling" five year-period assists in overall campus long-range budgeting.

An annual meeting of the Committee provides the formal approvals to be incorporated into the budget cycle for the following year. Use of this process affords a balanced melding of major maintenance and capital renewal. Where deferred maintenance programs have been established, they should be folded into overall institutional fiscal management responsibilities of the Review Committee.

Summary

The successful facilities administrator is aware that higher education does not operate in a value-free environment. It is affected by other than technical requirements to extend the life of plant assets. The impact of distinguished academicians on facilities improvements, the personal preferences of senior administrators, the influence of donors, and campus community sentiments also come into play in the capital budgeting process.

Decision-makers involved in this process must have confidence in the technical evaluations produced by the facilities audit, and the audit must be supported by evidence that goals are being achieved systematically in an efficient, orderly fashion. Furthermore, there is no entirely objective method of selecting capital renewal/replacement priorities in a central budgeting process. Decisions must be reached by compromise between competing demands.

Chapter Seven PLANT RENEWAL FUNDING

Funding Sources

A campus' awareness that deteriorated facilities are a significant liability opens the question: *How much is needed to correct the problem and what sources are available?*

The answer comes in three parts. First, how much is needed to correct accumulated plant deterioration; second, what level of funding is required annually for capital renewal to offset future plant deterioration; and three, what funding sources are available. An institution with a physical plant in a satisfactory condition does not require any "catch-up" costs. However, a deferred maintenance backlog requires a funding program to either eliminate or reduce backlogs to a controlled level. The life cycle of buildings is made up of components, systems, and equipment requires regular funding for renewal to offset deterioration. This can be accomplished by an annual renewal allowance added to routine and major maintenance in the operating budget.

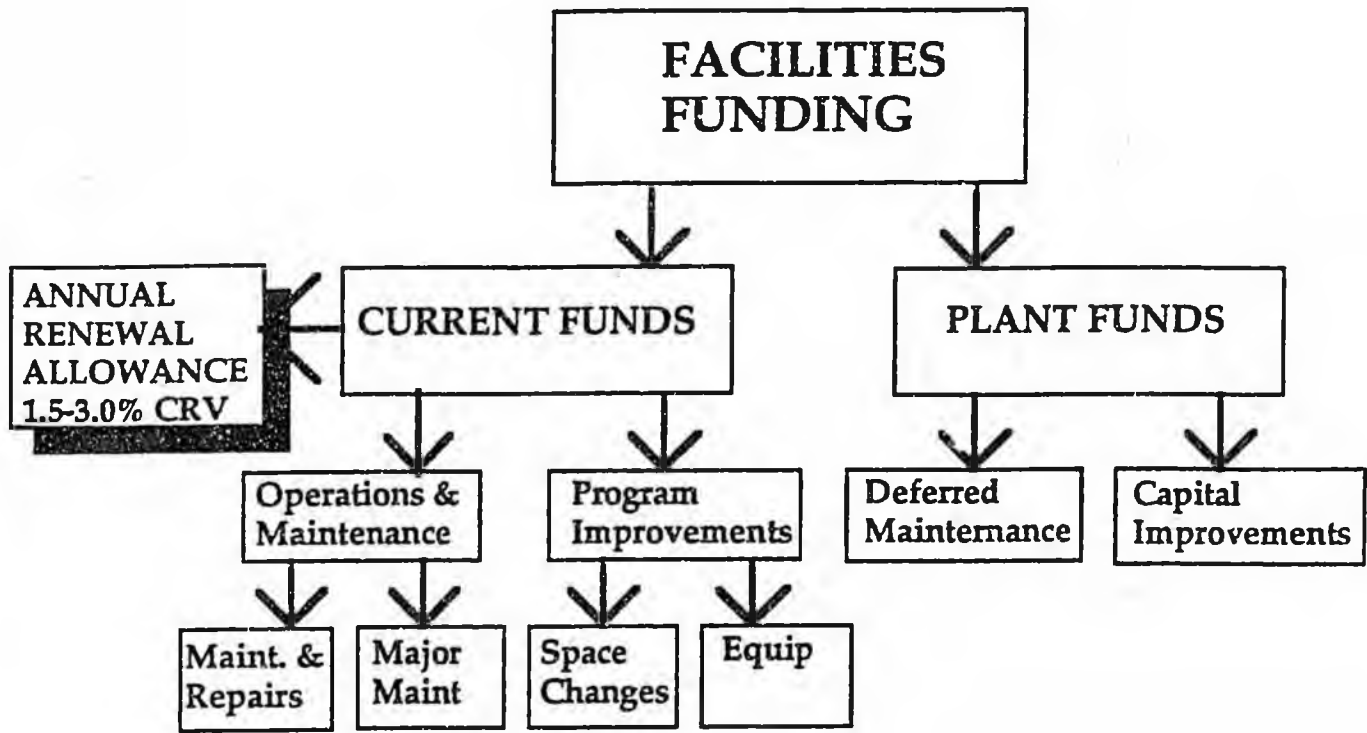
Understanding the various streams of funding is a starting point in answering the plant renewal funding question. Figure 15 illustrates the flow into facilities management from principal funding sources (current and plant funds) for preventing facilities deterioration and renewing facilities:

- Current Funds (Operations and Maintenance)
 - Routine Maintenance
 - Major Maintenance
 - Program Improvements
- Plant Funds
 - Renovations
 - New Construction

A funding model for maintenance and plant renewal integrates the streams of funding from current and plant funds to maintain an adequate operational condition for buildings, grounds, utilities, and equipment and offset plant deterioration. Plant funds are used on the occasion of a capitalized project and merge into three streams of funding.

There are two shortcomings in this model of typical institutional budgeting: 1) the allocation of funds for program improvements which are made available from operations and maintenance budgets; and 2) inadequate funding for plant renewal. In order to catch-up on deferred maintenance "one-time funding is required to be added to the funding

FIGURE 15
FACILITY FUNDING SOURCE -ANNUAL RENEWAL ALLOWANCE



streams to eliminate deferred maintenance. In addition, the renewal of the physical plant requires adequate funding to offset plant deterioration. This requires the introduction of an additional funding stream in the annual operating budget in the form of an annual renewal allowance.

Operations and Maintenance

Routine Maintenance

The facilities manager is responsible to see that the annual operating budget provides adequate funding for those scheduled and unscheduled maintenance activities that control the deterioration of the physical plant. Failure to provide for appropriate on-going routine maintenance aggravates longer-term plant deterioration.

A suitable method for distinguishing between normal and major maintenance is by setting cost ranges for each activity. For example, normal maintenance can be limited to tasks under \$5,000; major maintenance is in the range of \$5,000 to \$100,000. Projects exceeding this level are capitalized and funded by plant funds. The ranges can vary, depending on institutional practices and management preferences.

Major Maintenance

Major maintenance is typically treated in the operations and maintenance budget as a residual category after budgeting for administration, building and equipment maintenance, custodial services, utilities, and grounds maintenance. The residual treatment of major maintenance has proven to be inadequate to meet plant needs and explains how many campuses reached their current levels of deferred maintenance. The preferred approach (discussed below) is to establish an appropriate level of major maintenance and renewal funding in the operating budget to prevent the continuing deterioration and obsolescence of facilities and equipment.

Program Improvements

Campuses regularly change over time. Missions change; facilities must be adapted to changing standards and regulation; and programs are modified. Although building components and systems may be renewed, they do not necessarily satisfy program improvement requirements.

A common pitfall is the mingling major of maintenance and capital renewal with funding for upgrading and renovations to meet changing program demands. The first category deals with deteriorated facility conditions and protection of capital assets; the second category addresses modifications for functional inadequacies or obsolescence due to changing program requirements.

As final budget decisions are reached, pressure is often applied to shift major maintenance and renewal funding to meet program requirements. This is a realistic aspect of "budget politics", but a practice compromising protection of plant assets. Realistically, the central purpose of the academic enterprise is programs and facilities are viewed as a supporting medium for conducting programs. However, the facility manager must remain a staunch advocate to preserve major maintenance and renewal funding while creatively accommodating program requirements whenever and wherever possible.

Plant Funds

Capital Additions

Funds for offsetting plant deterioration are also contributed indirectly by capital additions. A facility replacement can eliminate a backlog of deferred maintenance by demolition of a structure. Although not necessarily planned as part of a deferred maintenance program, a facility replacement has the net result of eliminating an unsatisfactory facility condition.

Deferred Maintenance

Funds for deferred maintenance are used for "one-time" expenditures to eliminate backlogs of major maintenance. A deferred maintenance reduction program can extend over several years. Close coordination is required with operations and maintenance programs and capital improvements for efficient campus budgeting and management.

The important principle for campus policy makers is that a one-time elimination of deferred maintenance priorities does not solve the problem. Campus facilities continue to deteriorate and become obsolete, requiring an annual allocation for plant renewal to prevent future accumulation of deferred maintenance. As needs are reduced to manageable proportions, the operating budget can accommodate priorities as they are identified. A program results that maintains campus facilities in good repair, and functionally adequate for teaching, research, campus life, and public service.

Annual Renewal Allowance

Annual allocations for plant renewal can occur in either the major maintenance component of the operations and maintenance budget or as a special project allocations. The choice is in a strategy that is most acceptable to campus budgeting practices.

A method for estimating annual capital renewal funding uses life cycle concepts and avoids designation of specific projects. This method of capital budgeting and planning provides flexibility in determining which projects will be funded in any given year but gives facility

managers confidence that funds will be available to meet capital renewal needs. Evidence from empirical studies for life cycles of individual building components provide general parameters for annual capital renewal allocations. Acknowledging variance for age and type of facilities, a recommended range for annual capital renewal funding is 1.5 to 3.0 percent of total replacement value of plant. Various methods for application to individual campus conditions are outlined by: Sherman and Dergis, in a A Funding Model for Building Renewal⁵; Harvey Kaiser, in Crumbling Academe⁶; and Cushing Phillips, Jr., in Facilities Renewal: The Formula Approach⁷.

Funding Planning

Seeking funds for capital renewal on the scale required to reduce deferred maintenance backlogs is a challenging venture for higher education. The traditional method of funding capital improvements from traditional sources of gifts and grants is inadequate for the task faced by many campuses. Successful examples show that multiple funding sources are necessary, providing a stream of funding that meets capital and component renewal project priorities. The spreading out of projects allows pooling of multiple sources to meet annual needs. This principle enables funding planning that can incorporate some of the following experiences of public systems and independent institutions.

Bond Issues

Borrowing for capital projects is a routine practice for public systems of higher education and used occasionally by independent institutions. The persuasive case for capital renewal has transferred acceptability of issuing general obligation bonds, revenue bonds or other options for new construction to their use for reinvesting in existing facilities. The Commonwealth of Virginia, and the states of Georgia, California, Mississippi, and others, have recently initiated this practice. Vanderbilt University borrowed \$150 million to finance renovation and deferred maintenance projects.

Operating Budgets

Some institutions have initiated supplementing of annual operating budgets with additional funds for capital renewal. Even in difficult financial times, states and independent institutions have begun to

5. Sherman, Douglas R. and Dergis, William A. "A Funding Model for Building Renewal". Business Officer, February 1981.

6. Kaiser, Harvey H. Crumbling Academe. Association of Governing Boards of Universities and Colleges. Washington, 1984.

7. Phillips, Jr., Cushing. "Facilities Renewal: The Formula Approach". Proceedings of the Seventy-Third Annual Meeting of APPA. Washington, 1986. pp 103-121.

reallocate financial priorities by establishing an amount in the operating budget specifically for deferred maintenance.

The College of Wooster initiated a funding model in 1977 using a "capital charge" budgeting concept to develop a reliable source of capital renewal funding for five year planning cycles. An amount incorporated annually into the operating budget was defined as a charge to create a reserve for funding capital renewal and debt reduction. An unrestricted gift was allocated to a reserve fund to initiate the concept. Each year's charge to the annual operating budget is an average of projects budgeted in the current year and estimates of projects to be done in each of the next four years. The pool of reserve funds is drawn down as required by priority projects.

The Commonwealth of Virginia developed a maintenance reserve appropriation in 1982, distributing funds to public institutions using a formula developed by Douglas R. Sherman and William A. Dergis ("A Funding Model for Building Renewal, 1981). Each institution is required to prepare a maintenance reserve plan describing projects. Funding is a supplement to the operating budget for maintenance, following an assumption that approximately 50 percent of the formula amount is already contained in the operating budget.

Depreciation Accounting

The introduction of depreciation accounting to higher education in 1990 offers a potential solution to provide a constant funding source for capital renewal. Although not sufficient to fund substantial backlogs of deferred maintenance, maintenance depreciation reserves can provide a substantial source for renewal funding. The challenge is create depreciation reserves from current revenues equivalent to the declining value of capital assets. Some institutions that were able to use off-balance funding for capital renewal are now creating depreciation maintenance reserve funds from revenues and including them in operating budgets.

The model created by Boston College in 1976 combined the annual operating budget and a separate capital budget for renewal funding. Somewhat unique, Boston College was able to rely on unexpended depreciation reserves for capital budgeting. Depreciation accounting and funding the depreciation charge through its operating budget was an innovative technique. Based on the concept that current users should pay for renewal and replacement, an equitable charge was included in the annual operating budget to develop a consistent source for funding facility renewal. The retirement of long term debt and a reduction in acquiring debt for new projects will improve the allocation of available

funds for future renewal.

Quasi-Endowment Funds Conversion

Institutions with quasi-endowment funds or "funds functioning as endowment" have sacrificed interest earnings by designating their use for capital renewal. This is a cautious action requiring approval of a governing board, but is a valid one when necessary to fill a gap between unavailability of current revenues and avoiding a choice to incur additional debt. Rensselaer Polytechnic Institute plans to partially fund \$142 million in deferred maintenance by conversion of unrestricted quasi-endowment funds.

Plant Fund Reserves

The building up of plant fund reserves by transfers from income surpluses offers a source for capital renewal funding. This is a decision made in assigning priorities in the institutional budget-making process. Although not a guaranteed stream of funding, prudent financial management can create reserves allocated to fund deferred maintenance projects. Reserves can be drawn down from a pool of funds as projects are defined and expenses incurred. Syracuse University used plant fund reserves to supplement maintenance operating budgets for funding over \$150 million in capital renewal and replacement over a fifteen year period, beginning in 1973.

Fund Raising

Obtaining gifts for capital renewal represents a greater challenge than funding new construction. New or expanding programs or replacement of existing facilities have an appeal for donors not easily addressed by requests to fund deferred maintenance. However, as decaying campus facilities became a high priority, attention has shifted from new projects to renovating existing facilities as a target for designated gifts.

Strategies have varied, from individual campaigns for specific facilities to an overall fund raising effort with unrestricted gifts channelled to capital renewal. These approaches afford alternatives for development programs and donor choices. Some campuses have prepared lists of capital renewal projects to be included in major fund raising programs. Changes in policies of foundations have seen the new priorities as valid reasons to award grants in support of renovation projects. Pooling challenge grants with gifts and other institutional resources can achieve a goal for a designated project not easily approached for a single gift.

Energy Conservation

Deferred maintenance projects for mechanical and electrical systems,

utilities infrastructure, or central energy plants can be treated as unique capital renewal projects for energy conservation. Facilities audits have shown that 40 to 50 percent of deferred maintenance exists in these categories. The rationale that energy conservation will result from these projects is based on cost-benefit analyses identifying pay-back periods. Thus, an investment in energy conservation can be considered self-financing.

Vanderbilt University finances energy conservation by a utility depreciation reserve created by a 14 percent "tax" added to the University's electric bills. The reserve has been supplemented by energy conservation grants. Syracuse university has obtained over \$6 million in energy conservation grants, some at 100 percent of project costs and others as matching grants. Sources included federal and state programs, and programs offered by the local public utility to stimulate demand-side energy reductions. Incentives offered by private companies to participate in energy savings are an alternative method of funding a component of deferred maintenance.

Chapter Eight

EFFECTIVE PRESENTATIONS

An important component of capital renewal and deferred maintenance reduction programs is reporting to governing boards, campus senior management, and line managers. Because facility management serves both policy matters and is a day-to-day management concern, appropriate reporting must be designed to facilitate decision making at various levels.

A successful presentation to an audience on any subject begins with thorough preparation. Part of this preparation involves getting a sense of the decision-making environment, and other issues facing an approving body.

All of the technical expertise involved in preparing project budget requests will be wasted if not effectively presented. A thoroughly prepared presentation, well-documented and imaginatively delivered, will effectively convey the message and have a greater chance of success. The presentation should emphasize how the requested projects will improve facility conditions.

Documentation

The documentation must be meticulous in preparation and detail because the sharpest fiscal minds in the institution will usually be present. Any references to costs, financing alternatives, or cost-benefits will undergo the most thorough scrutiny. Expect the unexpected: "What happens if we don't do the work?" or, "Can't our own people do the work as regular maintenance?" The facilities audit should be referenced to reassure that a comprehensive inspection program has identified the institution's highest priorities.

Format

Before beginning the presentation, considering the format. The list of projects and printed documents are the backbone of the presentation and should be presented in an appropriate format. If the report is to be submitted in print form only, without oral presentation, consider what charts, graphs, and illustrations would be helpful. The report itself may be presented as a condensed executive summary, or in an extensive narrative that includes observations and commentary.

The facilities administrator should also provide material which is concise, easily understandable (free of jargon), and attractively presented.

Do not oversimplify for readability; do design the documents for ease of cross referencing. Establishing the importance of the subject is essential. The University of Washington discovered this with their film of existing conditions; a slide show by the University of Maryland on the destructive impact on academic programs and campus life caused by deteriorating facilities was persuasive to their Board of Regents.

Visual Aids

Develop a theme for the presentation: organize it so that the train of thought can be followed. Above all - keep the presentation simple and to the point.

At quarterly or annual reviews of budget requests for major maintenance and capital renewal needs, the facilities manager must play the role of technician, counselor, and politician. Communication to the intended audience is the watchword: graphics, visual aids, and comprehensive reports should provide conclusions and recommendations. Large charts and slides or videotapes of existing conditions have a greater impact than three hours of droning prose.

Budget Review Presentations

The supporting printed materials for a budget review session should be submitted in advance to all participants. The following format for budget review sessions (see Figure 16) should be used to ensure the clarity and conciseness of the presentation.

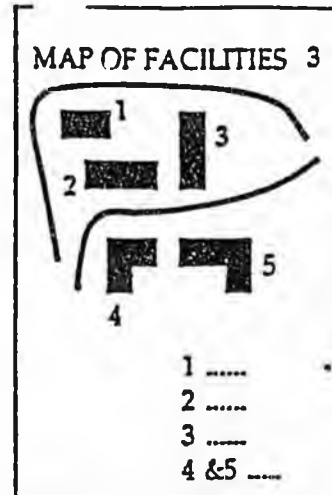
1. Title Sheet
2. Executive summary of the major conclusions and recommendations
3. A map of facilities with building names
4. Facilities age in periods of five and ten years
5. Condition summary of priorities from the facilities audit building component form
6. Maintenance deficiencies summarized by categories using cost estimates from facilities audit inspection forms
7. Maintenance deficiencies summarized by selected components from the facilities audit inspection forms
8. Project summaries identifying the building or facility, short descriptive title, and project budget. Illustrating funding source separating operating from capital budgets can be helpful
- 9-. Detailed project descriptions presented on individual sheets for each project.

FIGURE 16

FACILITIES AUDIT PRESENTATIONS

TITLE SHEET 1

EXECUTIVE SUMMARY 2



FACILITIES AGE 4

Date	GSF	NSF
1980-		
1970-79		
1960-69		
1950-59		
1929-49		
Pre-1929		
Totals	_____	_____

CONDITIONS 5

PRIORITIES

1	\$ _____
2	\$ _____
3	\$ _____
4	\$ _____
5	\$ _____
Totals	\$ _____

MAINTENANCE 6 DEFICIENCIES

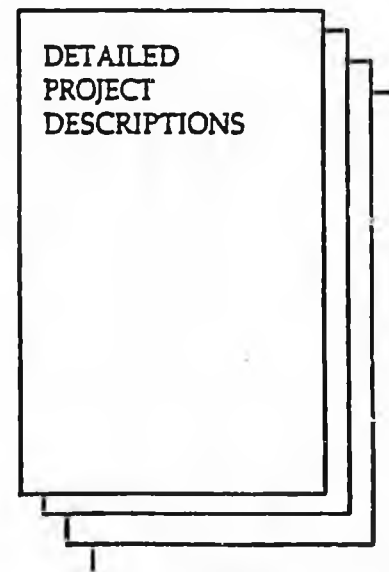
Category	\$
Life Safety	\$ _____
Code Req	\$ _____
Wk Orders	\$ _____
Maj Maint	\$ _____
Cap Ren	\$ _____
Disabled	\$ _____

MAINTENANCE 7 DEFICIENCIES

Selected Components	#	\$
Roofing		
Exter Clos		
HVAC		
Electrical		
Safety		
Totals	_____	_____

PROJECT 8 SUMMARIES

Title	\$
1.	
2.	
3.	
4.	
5.	
6.	



Items to Consider

Once the data has been compiled, how does one gain support for major maintenance and capital renewal/replacement requests? Essentially, by developing an effective presentation – one that can sell the conclusions and recommendations. Consider the following items when presenting budget requests:

- **Overview.** Does the presentation show a broad understanding of the budgetary mechanism and present a responsible fiscal position?
- **Credibility.** Does the presentation reflect that previously allocated funds were well used. Does it take the initiative for the best use of new resources for new programs?
- **Competency.** Did the audit team and the implementing staff appear professional and competent during the audit process and in follow-up activities?
- **Thoroughness of Preparation.** Was the budget request thoroughly researched, analyzed, and professionally presented. The form and content of the presentation must be an accurate presentation of the facts, objective, non-contradictory, and capable of withstanding thorough scrutiny.
- **Supportive Senior Administrator.** The budgetary allocation process represents proposals competing for limited financial resources. Without a strong advocate, requests may be rejected. A senior administrator who understands physical plant needs, conclusions and recommendations, is invaluable ally in the funding and implementation process.
- **Preparation for Implementation.** The conclusions and recommendations of the budget requests must be in an immediately usable format. Administrators who will be involved in the implementation process should be included in formulation of conclusions. Operational staff should also be involved when possible. The end result is better for their contributions and it ensures that the purpose of the proposed projects, are clear to all parties.

And remember: Communicate!

Chapter Nine A PROSPECTUS OF FUTURE CAPITAL PROJECTS

Forecasting trends for capital projects is risky because of the diversity of higher education. Regional disparities distort enrollment projections and economic conditions. Competency of management and the fiscal condition of campuses also influences whether risks can be taken or conservative policies must be sustained.

The potential for capital projects is evident from various surveys and broad national trends already visible on college and university campuses. Whether they increase or slow down depends to a large extent on the national economy and access to new forms of financing. A prospectus for the next decade includes the following programs of capital asset management and program improvements.

Capital Asset Management

Deferred Maintenance and Plant Renewal

Deferred maintenance is defined as projects accumulated by inadequate annual operations and maintenance budgets or ignored for higher campus priorities. Plant renewal offsets deterioration and extends the life of facilities.

There are two approaches for determining deferred maintenance and plant renewal funding needs. The most thorough approach is a facilities audit of existing conditions of buildings, grounds, utilities, and equipment. An alternate method is to use life cycle analysis in lieu of surveys of actual backlogs of deferred maintenance. By factoring the age and replacement costs of building components, a building renewal allowance can be budgeted to offset facility aging each year. Empirical studies have produced ranges of 1.5 to 3.0 per cent of current plant replacement value supplementing the annual operating budget for operations and maintenance as appropriate levels for plant renewal.

At a modest inflation rate of 3 per cent, an annual commitment of between \$4 and \$5 billion is required nationally to eliminate deferred maintenance during the next decade. In addition, a minimum of 1.5 to 3.0 per cent of total replacement value of buildings and equipment requires almost \$3 billion a year for plant renewal. For a campus with \$300 million in current replacement value for buildings and equipment, this translates into \$60 million for deferred maintenance and \$4.5 million a year for capital renewal. Omitted are projections for program improvements.

It is an important principle for campus decision makers and higher education policy makers is that a one-time elimination of current renewal priorities does not solve the problem. As campus facilities continue to deteriorate and become obsolete, an annual allocation for renewal is necessary to prevent further accumulation of deferred maintenance. Establishing an appropriate level in the beginning of a facilities program may have to include catch-up costs.

Regulatory Standards

Life safety requirements provide adequate fire protection, exits, and remove unsafe conditions to comply with building codes and other regulatory standards. Environmental health and safety needs include compliance for asbestos removal, and elimination of sources of PCB's. Hazardous wastes and toxic materials also impose new standards. Accessibility for the disabled requirements created by the Americans with Disabilities Act of 1992 will require additional features in older buildings and in new designs.

Concerns for "sick buildings" affect the quality of working environments and revisions in air handling systems in buildings with unique design features of low volume air changes. As new environmental hazards are discovered and regulations developed facilities managers will need to understand the nature of the problem and plan and implement corrective programs.

Historic Preservation

Decisions to renew or replace older facilities will be influenced by increasing concern for historic aspects of some structures, and will affect plans for major maintenance and facilities renewal.

Campuses which saw dramatic growth in the 1950's and 1960's will also face alumni advocates with nostalgic feelings for preserving the campus as they knew it. They will resist alterations and additions drastically affecting older facilities. Despite administrative preferences, external influences can force restoration or adaptive reuse and compromises in campus planning by insisting on the restoration or adaptive reuse of certain structures.

Restructuring

The budget reductions required changing economic conditions has affected the capital renewal planning for many public systems and private campuses. Restructuring has impacted funds available for capital renewal and deferred maintenance reduction, along with staff available for managing programs.

Functional Program Improvements

Quality of Campus Life

Undergraduate and graduate students, faculty, and staff will demand facilities that respond to contemporary standards of space, ambience, and comfort. Facilities incorporating community services and fostering industry and government cooperation will require space, equipment and other features that might be considered luxuries in higher education buildings in the past. Air conditioning, elevators and "social" spaces not usually included in higher education buildings will raise the ratios of net to gross space, modifying space design standards and increasing building and operating costs.

Motives might include improving the attractiveness of buildings and grounds for enrollment management. As tuition and other costs rise, shabby physical plants and inadequate services will become pivotal issues in student recruitment and faculty and staff morale. Addressing a multi-ethnic society demands new social spaces and services to modify or expand student centers.

Potential projects providing a balance between attractive and adequate space for teaching, study, and student life include:

- Modernizing residence halls to lower density, providing more private accommodations, air conditioning, and increased social space.
- Recreation facilities requiring improvements and expansion following patterns on social emphasis on fitness and life-long well being. More indoor and outdoor recreation facilities will be provided in response to this demand.
- Student activity centers combining food service, meeting and recreational space.
- Day care centers to meet the changing student body and work force.

Economic and Social Development

The need to expand capital funding sources will bring higher education into more partnerships with government, corporation, and local communities. An emerging theme is the role campuses can play in economic and social development of communities, regions, and the nation. Technology transfer from campus laboratories to industry is an example of this trend. Another is the creation of multi-disciplinary centers dedicated to community service.

As higher education accept external funds for these programs concessions will be required in campus access and building design. Improvements will be necessary to meet corporate standards, improved overnight accommodations, as well as auxiliary services for visitors.

Science and Technology

The White House Science Council Panel on the Health of U.S. Colleges and Universities stated: "The strength of the nation, in trade defense, and health has been directly related to past investments in science and technology". A central theme of the Panel was increased support for science teaching and research and the critically important relationships between universities, government, and industry.

Science and technology teaching and research facilities tolerated as marginal or obsolete have reached the end of their useful life and require replacement on many college and university campuses. The National Science Foundation (NSF) has drawn attention to the critical state of teaching and research laboratories, equipment and the long term deleterious effects on the nation's economy and international position in technological developments.

NSF studies provide the most current sources on science and technology plant and equipment. Evidence of conditions is illustrated by the levels of funding for science and technology: capital expenditures (in 1982 constant dollars) declined from \$1.7 billion in 1964 to a low of \$900 million in 1979. Expenditures have gradually increased since then to \$1.4 billion in 1986, but funds available from all sources have failed consistently to reflect rising costs and declining useful life of academic research equipment.

A 1988 NSF survey of scientific and research facilities estimated expenditures for new construction each year from 1986 to 1989: the projected annual amount was \$1.6 billion a year. The same survey reported on the amounts of deferred renewal/replacement and planned spending: for every dollar spent, \$3.60 was deferred.

Major upgradings and expansion to meet space and equipment requirements can be expected during the next decade, in part as a lever for economic development. Technological advances will create new demands for expensive buildings, equipment, and campus infrastructure systems.

Program Consolidation

Rapid growth of some academic departments, institutes, and research programs required locations remote from a home college or school. Efforts to bring these units close to a central academic focus for a discipline will result in additions or new facilities.

Multi-Disciplinary Programs

The trend toward several disciplines combining to produce new academic and research programs is driven by the nature of academic inquiry and the overlapping of specialties across traditional fields. Traditional academic departments will be replaced with new organizational and space configurations requiring major renovations to existing space or new facilities. Electronic communications and costly research equipment affect these changes, along with policies of government, corporations, and foundation funding sources.

Computer Systems and Spaces

The widespread access to campus computing and networks requires "wiring the campus". New inside and outside cable plant will be necessary to coordinate the task of connecting central computing equipment to local area networks, computer terminal clusters, and individual workstations. The conversion of existing spaces and creation of new facilities will increase demand for environmentally controlled spaces. One consequence will be increased operating costs and more technologically sophisticated facilities management staff.

Telecommunications

The impact of divestiture by voice communications sources has moved campuses into an era of self-owned telecommunications systems. More and more campuses are becoming private telephone companies at major capital costs. Simultaneously, the dramatic evolution of computing technology has placed terminals and workstations in administrative office, classrooms, and student residence halls. The result has been a trend to combine voice and data with integrated switches (computers) for transmission over comprehensive systems for internal campus and external connections.

The ability to teach via satellite will enable remote geographic areas to share in campus-based programs. Land grant institutions especially will be involved in serving traditional missions by transmitting and coordinating programs to off campus locations.

Chapter Ten MANAGING CAPITAL RENEWAL AND DEFERRED MAINTENANCE REDUCTION PROGRAMS

How To Manage Managing the long-range integrity of facilities in support of an institution's goals and missions is a broader challenge than routinely responding to repair emergencies or requests for modifying offices or laboratories. How to manage a capital renewal and deferred maintenance reduction program starts with clear understanding of the following:

- **View a facility as a collection of components and systems**
Buildings, grounds, and utilities are made up of components forming systems. The deterioration of a component can cause breakdowns in other parts of a system. Evaluation of a repeated maintenance problem should consider the system nature of facilities. Facility deterioration can be offset by maintenance management staff pooling knowledge of unsatisfactory conditions which are developing into major ones.
- **Keeping track of facility conditions**
The annual audit of physical conditions should be a basic practice of facilities management. Without a familiarity of conditions, the facilities manager is unaware of the most pressing needs. Lack of knowledge prevents anticipating major problems and avoiding budget surprises for overall campus fiscal management. The facilities audit should be performed annually to note current problems and priorities.
- **Maintain a five-year program of major maintenance and capital renewal**
A five-year capital budget plan provides a level of confidence is provided for senior administrators in the facilities management staff by regularly reviewing overall campus capital requirements. A level of capital requirements is established in long-range budget base planning, offering flexibility for emergencies or special situations which cannot be anticipated. Finally, the facilities manager will have an operational framework for maintenance management to direct staff, materials, and contractors to appropriate priorities.
- **Differences between maintenance, repairs, and major maintenance**
The categories may sound so routine that the important differences

are not distinguished. A simple check on the practices of work management and control is the proportion of staff devoted to routine building and preventive maintenance, and to major maintenance. Although many facilities managers take justifiable pride in their staff's construction accomplishments, they are mistaken if they look at their labor pool primarily as a construction team. Unless located in an area where competition from contractors is unavailable, the wrong emphasis is being placed on work management if the majority of staff labor hours is on major maintenance.

- **Manage maintenance as opposed to maintaining management**

Any size institution needs a work control center to assign tasks, control material purchases, and be a responsive service organization. Similarly, annual capital budget planning is part of a five-year capital budget plan that integrates all funding streams with work priorities. Failure to bring these basic management programs into routine operations is a sign of a complacent management and a sign of an organization prepared to complain about inadequate funds and a lack of appreciation for management and staff that is dedicated, loyal, hard working (overworked, and underpaid at that), etc.

- **Facility management is a support service**

The central purpose of an academic enterprise is a quality of academic programs. The quality of campus life for all members of the campus community is a close second. In terms of allocation of resources, facilities come in at least third. Something else, hopefully, may qualify as last. Overcoming disappointments in the occasional short shrift in funding is found by accomplishment in providing efficient service. Prompt responses to requests, explanations for delays and postponements, and attention to meeting service needs of the specific requirements of a college or university are traits of the service organization.

For the manager understanding these principles, a fresh approach to practices and procedures may be enlightening. Stand back and take a good stock of the condition of plant, including buildings, grounds, utilities, and equipment. Walk through the buildings and keep in mind the operations and maintenance budget. Be candid in the self-evaluation of the maintenance management's effectiveness. Also have a feel for the previous annual funding for major maintenance and the tempo of plant additions. (A quiet period or increase in activity? A shift from new construction to renovations?) Set aside frustrations from

"inadequate" budgets and be self critical of work control, staff performance, and the presentations of requests for increased base budgets and special capital appropriations.

As the facilities administrator walks the grounds and through buildings from basement to roof, note should be taken of deferred maintenance, especially for life safety categories and a building's exterior envelope - roofing, flashings, mortar, or other sealants - and places where deterioration permits moisture penetration. Check the operating records for failures of mechanical systems and complaints about heating and cooling. Finally, observe environmental safety conditions such as exits, toxic waste storage, fire sprinklers, and smoke detectors. And observe for any obstacles to the disabled.

This is an informal checklist to set the facility manager onto the task of preparing a strategy for a major maintenance and capital renewal program. Formal aspects of the program begin with senior plant administrators evaluating the overall facilities management program for the institution. Later, tasks are defined for the administrator of the small campus to personally take on with available assistants, or for the delegation of staff at the larger campus.

An Action Plan for comprehensive management of capital renewal and deferred maintenance reduction programs includes:

1. Building a constituency of campus support
2. Develop a work plan
3. Inventory conditions
4. Select priorities
5. Determine funding requirements
6. Seek funding sources
7. Create public awareness of facilities conditions and funding needs

Continue the cycle until results are produced. the actions are necessary to prevent further plant deterioration and protect capital assets.



HOUSE STATE AFFAIRS COMMITTEE

DATE: January 25, 1994

PLACE: Capitol, Room 102

SUBJECT OF MEETING:
 HB-277 Indemnification of Public Employees
 HJR-22 Legislature of 25 Senators; 50 Representatives
 *HB-345 Preservation of Public Facilities

NAME	REPRESENTING	BUSINESS/PERSONAL MAILING ADDRESS	ZIP	(H) PHONE	(W) PHONE	DO YOU WANT TO TESTIFY?	WHAT SUBJECT/ WHICH BILL?
Rod Wilson	DOT&PF	3132 Channel Drive Suw.	99801		165-6962	<input checked="" type="radio"/> Y <input type="radio"/> N	HB 345 (Available to also Answer Questions)
						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	
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						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	
						<input type="radio"/> Y <input type="radio"/> N	

HB

346

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO. SSHB 346

Revision Date: _____ Dept. Affected: Health and Social Services
 Title: An Act to amend voter registration law to BRU: State Health Services
comply with National Voter Registration Act of 1993 Component: Women Infants & Children
 Sponsor: ULMER
 Requestor: House State Affairs CO. PONENT SERIAL NO. #1013

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	00
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS	4.4	8.9	9.2	9.5	9.7	10.0
MISCELLANEOUS						
TOTAL OPERATING	4.4	8.9	9.2	9.5	9.7	10.0

CAPITAL EXPENDITURES						
-----------------------------	--	--	--	--	--	--

CHANGES IN REVENUES						
----------------------------	--	--	--	--	--	--

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	4.4	8.9	9.2	9.5	9.7	10.0
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL	4.4	8.9	9.2	9.5	9.7	10.0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year (FY94) cost \$ NONE

ANALYSIS: (Attach a separate page if necessary)
 The federal National Voter Registration Act of 1993 requires state agencies administering certain public programs, including WIC, to be voter registration agencies.

As the agency administering these programs, Division of Public Health, Maternal Child and Family Health offices, grantees and contractors must, under the federal law and this legislation, provide voter registration materials to all applicants for these programs and to clients who wish to report address changes to the Division of Elections. DPH staff and grantee staff must also assist applicants who request help in completing the voter registration forms and mail in the completed forms for individuals who do not wish to mail them themselves. Under federal law, public health applicants must be requested to agree to decline in writing to register to vote, and written declinations must be retained in state records.

SEE ATTACHED

Prepared by: Peter M. Nakamura, MD, MPH *3/17/94*
 Division: Public Health
 Approved by Commissioner: Margaret R. Lowe
 Agency: Department of Health & Social Services
 Margaret R. Lowe, M.Ed., Ed.S.

Phone: (907) 465-3090
 Date: 02/17/94
 Date: _____

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ANALYSIS (cont.):

These activities will increase the workload of already-overburdened staff in DPH and grantee offices throughout the state. We estimate that 10 percent of the approximately 14,578 applicants interviewed each year in our grantees offices will wish to register to vote when they apply for services, and that an equal number will request an explanation of the form or help with the form. We assume that each such interaction will require 10 minutes of staff time, including time to assemble materials, process mailings, and assist clients.

2,916 clients assisted x 10 minutes processing/client = 486 hours
 $\frac{486}{1950} = 0.25 \text{ FTE}$ $0.25 \times \$33,900/\text{year}/\text{FTE Clerk III} = \$8,475/\text{year}$

Personnel costs for years after FY95 are increased by 3.0 percent to account for inflation.

Additional PCN not requested: Grantees may require additional staff.

Estimated mailing costs: \$204/year

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO. SSBH - 346

Revision Date: _____	Dept. Affected: <u>Health and Social Services</u>
Title: <u>Motor Voter</u>	BRU: <u>Institutions and Administration</u>
Sponsor: <u>Representative Ulmer</u>	Component: <u>Mental Health/DD Admin</u>
Requestor: <u>House State Affairs</u>	COMPONENT SERIAL NO. <u>310</u>

Expenditures/Revenues:

(Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES	5.3	10.9	11.3	11.7	12.0	12.5
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT	24.1	0.0	0.0	0.0	0.0	0.0
LAND & STRUCTURES						
GRANTS, CLAIMS	125.6	260.0	269.1	278.6	288.3	298.4
MISCELLANEOUS						
TOTAL OPERATING	155.0	270.9	280.4	290.3	300.3	310.9
CAPITAL EXPENDITURES	0.0					
CHANGES IN REVENUES	0					

FUND SOURCE

(Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	155.0	270.9	280.4	290.3	300.3	310.9
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL	155.0	270.9	280.4	290.3	300.3	310.9

POSITIONS:

FULL-TIME	0					
PART-TIME	0					
TEMPORARY	0	0	0	0	0	0

Estimate of current year (FY94) cost \$ _____

ANALYSIS: (Attach a separate page if necessary)

This bill would require the four office locations of the Division of Mental Health and Developmental Disabilities and sixty-five grantees to conform to the "National Voter Registration Act of 1993", in which each location will provide for voter registration and reregistration of all persons being served or requesting services in offices or at consumer residences. Furthermore, all locations will have to be trained in voter registration and will provide to the public the necessary forms supplied by the Division of Elections for registration. Each location will be responsible for assisting each individual wishing to register, for mailing all completed registration forms, and for notifying the election supervisor/director of all denials as specified by bill.

Prepared by *[Signature]*
 Division: Mental Health and Developmental Disabilities

Approved by Commissioner: *Margaret R. Lowe*
 Margaret R. Lowe, M.Ed., Ed.S.
 Agency: Department of Health & Social Services

Phone: 465-3370
 Date: 02/17/94

Date: 2/18/94

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ANALYSIS (cont.):

Assumptions:

The cost projections are based upon the following information: The average number of monthly consumer contacts by each office location or grantee program location multiplied by the average time projected to explain the information and to assist the consumer with the registration process. It is to be remembered that the population being served by the Division of Mental Health and Developmental Disabilities is more difficult to work with and habitually has a much harder time understanding the rationale behind any requirement. The needed staff time is based upon the FTE (1950 hours) at the range of a Clerk Typist III.

- Personal services based on 0.32 of an FTE at Clerk Typist III, Range 8, Step A to be used to offset personnel costs.
- Grants for all grantee's to cover their time in providing the technical assistance to consumers during the registration process based upon the equivalent of 7.35 FTE's at Clerk Typist III, Range 8, Step A, for the cost of mailing in the completed forms, corresponding with the Division of Elections on denials, and for providing storage of the forms.

Computations:

All expenditures have been adjusted with an inflation factor of 3.5% for each year after FY95 and carried out to FY2000. Also, only six months of FY95 have been figured in due to the date of expected implementation.

Economic Impact:

More people will be registered to vote and the State of Alaska will be in compliance with the National Voter Registration Act of 1993 and not be in jeopardy of any penalties for non-compliance.

FISCAL NOTE

**STATE OF ALASKA
1994 LEGISLATIVE SESSION**

BILL NO. SS HB 346

Revision Date: _____ Dept. Affected: Health and Social Services
 Title: An Act amending Alaska law to conform to the National Voter Registration Act of 1993 BRU: Public Assistance Administration
 Component: Eligibility Determination
 Sponsor: Ulmer
 Requestor: House STA COMPONENT SERIAL NO. 0236

Expenditures/Revenues:

(Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY 98	FY99	FY00
PERSONAL SERVICES	10.2	21.0	21.6	22.2	22.9	23.6
TRAVEL	0.0	0.0	0.0	0.0	0.0	0.0
CONTRACTUAL	0.2	0.4	0.4	0.4	0.4	0.4
SUPPLIES	0.0	0.0	0.0	0.0	0.0	0.0
EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0
LAND & STRUCTURES	0.0	0.0	0.0	0.0	0.0	0.0
GRANTS, CLAIMS	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL OPERATING	10.4	21.4	22.0	22.6	23.3	24.0
CAPITAL	0.0	0.0	0.0	0.0	0.0	0.0
REVENUE FUND SOURCE	0	0	0	0	0	0

FUNDING:

(Thousands of Dollars)

1002 Federal Receipts	5.2	10.7	11.0	11.3	11.6	12.0
1003 GF Match	5.2	10.7	11.0	11.3	11.7	12.0
1004 GF	0.0	0.0	0.0	0.0	0.0	0.0
1005 GF/Program Receipts	0.0	0.0	0.0	0.0	0.0	0.0
1006 GF/MHTIA	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	10.4	21.4	22.0	22.6	23.3	24.0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year (FY94) impact: NONE

ANALYSIS: (Attach a separate page if necessary)

The federal National Voter Registration Act of 1993 requires state agencies administering certain public assistance programs, including Aid to Families with Dependent Children (AFDC), Food Stamps, and Medicaid, to be voter registration agencies.

(continued on page 2)

Prepared by: Jan L. Hansen, Director
 Division: Division of Public Assistance
 Approved by Commissioner: Margaret R. Lowe, M.Ed., Ed.S
 Agency: Department of Health & Social Services

Phone: 465-2680
 Date: 2/17/94
 Date: 2-18-94

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ANALYSIS (cont.):

Under SSHB346, Division of Public Assistance field offices must provide voter registration materials to all applicants for all of the programs it administers and to clients who wish to report address changes to the Division of Elections. DPA staff must also assist applicants who request help in completing the voter registration forms and mail in the completed forms for individuals who do not wish to mail them themselves. Under federal law, public assistance applicants must be requested to agree or decline in writing to register to vote, and written declinations must be retained in state records.

These activities will increase the workload of already-overburdened staff in DPA offices throughout the state. We estimate that 10 percent of the approximately 35,000 applicants interviewed each year in our offices will wish to register to vote when they apply for public assistance, and that an equal number will request an explanation of the form or help with the form. We assume that each such interaction will require 10 minutes of staff time, including time to assemble materials, process mailings, and assist clients.

7,000 clients assisted x 10 minutes processing/client = 1160 hours

$\frac{1160}{1950} = 0.6 \text{ FTE}$ $0.6 \times \$33,900/\text{year}/\text{FTE Clerk III} = \$20,340/\text{year}$

The requirement takes effect January 1, 1995. FY95 figures reflect 6 months' costs.

Personnel costs for years after FY95 are increased by 3.0 percent to account for inflation.

Additional PCN not requested: personal services increment will be used to reduce V&T to absorb additional workload.

Estimated mailing costs: \$400/year

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO: HB 346

Revision Date: _____ Dept. Affected: Public Safety
 Title: An Act relating to voter registration BRU: Motor Vehicles
 Component: Field Services
 Sponsor: Representative Ulmer
 Requestor: H. STA COMPONENT SERIAL NO. 502

EXPENDITURES/REVENUES: (Thousands of Dollars) (inflation not included)

OPERATING	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00
PERSONAL SERVICES	73.4	73.4	73.4	73.4	73.4	73.4
TRAVEL						
CONTRACTUAL	7.5					
SUPPLIES						
EQUIPMENT	10.0					
LAND & STRUCTURES						
GPANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	90.9	73.4	73.4	73.4	73.4	73.4

CAPITAL						
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REVENUE FUND SOURCE:						
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FUNDING: (Thousands of Dollars)

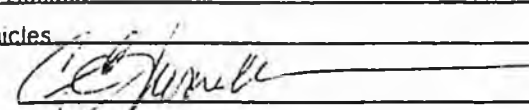
1002 Federal Receipts						
1003 GF Match						
1004 GF	90.9	73.4	73.4	73.4	73.4	73.4
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
TOTAL						

Estimate of current year (FY 94) impact: \$ _____

POSITIONS:

FULL-TIME	2	2	2	2	2	2
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary.) See attached.

Prepared By: Charles R. Hosack Phone: 269-5559
 Division: Motor Vehicles Date: 1/12/94
 Approved by Commissioner:  Date: 1/13/94
 Agency: Richard I. Burton, Dept. of Public Safety

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The Division of Motor Vehicles currently offers voter registration at all field offices as required by AS 28.05.045. This bill expands on this to include the requirements of the federal National Voter Registration Act of 1993 (Motor-Voter Law). The Motor-Voter Law requires states to make a driver's license application include a voter registration application. The state may not require the applicant to fill out extra forms or provide information twice. The Division of Motor Vehicles will receive no federal funding for this Act.

The driver's license application will be revised to include the additional information needed for voter registration. The applicant must also have the opportunity to decline registration. The division must also forward all change of addresses to the Division of Elections unless the person specifies that the change is not for voter registration purposes.

The driver license computer programs will be changed to collect and print the information required for voter registration. The driver license database will be modified to collect and retain information if the driver declines to register. This programming effort will require 100 hours of programmer-analyst time at \$75.00/hour. Contract programmers will be used because the available staff is fully committed with other mandatory federal programs.

The Division currently registers voters but it is not currently mandatory to either register or decline to register. There will be additional work in registering additional voters and there will be additional time needed with each driver license transaction to explain the options to the individual. This work will be spread over the offices throughout the state and the total impact is estimated to be an increase of 2% over the current workload. To fund this the Division field office staff will be increased by 2% or 2 full-time positions and related equipment. Another method of illustrating this need is that an additional 1.5 minutes will be needed for each of the 165,000 driver license transactions completed each year. This time will be needed to complete the forms and to explain the law. The additional 1.5 minutes equates to 2 employee-years of work when applied to the annual volume of 165,000 transactions.

COST SUMMARY

Personal services - 2 PFT MVR I/II (Range 9B)	\$73.4
Contractual - 100 hours programmer time @ \$75/hr	\$ 7.5
Equipment - 2 terminal work stations @ \$5,000 ea	\$10.0

Note: The contractual and equipment costs are one-time costs only for the first year of the program.

01/13/1994 11:52:05 =====

01/13/94 Position Information Inquiry/Update 11:52:29

Position: 12-125305 Project: 0 Salary Costs: 24,288.00
Component: 12-55-07-07-01-03 Benefits Costs: 12,365.66
Scenario: 2 FY: 95 COLA %= 0.00 Total Costs: 36,653.66

Actuals from Payroll (Status: FILLED) Retirement Code: A

A Step: B for 12.0 months & Step: C for 0.0 months (total: 12.00)
94/03/16 Merit Date; use merit defaults? N (8.5 @ B & 3.5 @ C)
1 Class/Sched Prefix: 1 Schedule: 1A (actual: 1A)
GG Bargaining Unit: GG Range: 09 (actual: 08)
EBA Location Code: EBA Place: ANCHORAGE
P7549 ? Job Class Code: P7550 Title: MOTOR VEHICLE REP II
F Seasonal Indic.: F Type: FACL - FULL TIME / OMB AUTH

Optional Override Salary Rates:

Monthly Rate: 0.00 for 0.0 months & rate of 0.00 for 0.0 months
Hourly Rate: 0.00 for 0.0 months Frozen at this rate? (Y/N): N

Press ENTER to update record; enter # or use PF key to go to another screen:
1=Premium pay info 2=Funding info 4=Code Translations 6=Calculations
8=Detail Report 12=Exit w/o update selection: 0

Alaska State Legislature

HOUSE OF REPRESENTATIVES



REPRESENTATIVE FRAN ULMER

MEMORANDUM

February 18, 1994

FEB 18 1994

TO: Rep. Al Vezcy, Chair
House State Affairs Committee

FROM: Rep. Fran Ulmer

RE: HB 346, Motor-Voter bill

The purpose of HB 346 is to conform state elections and other laws to the requirements of the National Voter Registration Act of 1993, P.L. 103-31. The federal act requires that states make conforming changes to state statutes and have them in place and in effect by January 1, 1995. The general purpose of the act, and of HB 346, is to increase the ease and accessibility of voter registration. The bill includes:

Major Provisions of HB 346:

- 1) **Registration locations:** Voter registration may be initiated at a variety of state offices:
 - **Division of Motor Vehicles:** Registration may take place simultaneously with an application for a driver's license, identification card or vehicle registration, or renewal of any of these;
 - **Public Assistance:** Registration may occur in field offices receiving applications for public assistance;
 - **Disabled Alaskans:** Registration may occur in agencies providing services to persons with disabilities.
 - **Armed Forces:** Registration may occur in the recruitment offices of the armed forces.
 - **Other agencies:** Registration may take place in any state agency designated by the director of the Division of Elections as a voter registration agency.



- 2) **Change of address:** A change of address form submitted to update a driver's license will also serve as notice of a change of address for voter registration purposes.
- 3) **Registration by mail:** A person may register to vote by mail without the application needing to be notarized.
- 4) **Improper activities of a registrar:** Prohibits a registration official from seeking to influence a voter registration applicant's political preference regarding political party; discouraging an applicant from registering to vote; leading an applicant to believe that voter registration will have any bearing on the other services delivered by the office; or use the information for any purpose other than voter registration.
- 5) **Removal from voter registration list:** Prohibits a voter's name from being removed from the voter registration list unless specifically requested by the voter; or because of criminal or mental incapacity; or in the event of the death of the registrant; or a change in the residence of the voter. The failure to vote is not a reason to remove the voter's name from the list.
- 6) **Confidentiality of records:** Establishes that the records of the Division of Elections are public records; however, the voter's social security number, date and place of birth, telephone number, vote number and type of ballot voted by the voter in the state primary election are confidential.

The Alaska Division of Motor Vehicles has provided voter registration services to the public for many years. The experience of that agency demonstrates that this important public function may be fulfilled with a minimum of additional expense and training. Other agencies authorized in HB 346 to provide registration services should enjoy the same ease of operation when procedures for voter registration have been adopted.

STATE OF ALASKA
1994 LEGISLATIVE SESSION

FISCAL NOTE

BILL NO.

HB 346

Revision Date: _____ Dept. Affected: Corrections
 Title: "An Act RE: National Voter Registration Act." BRU: None
 _____ Component: None
 Sponsor: Rep. Ulmer
 Requestor: Governor COMPONENT SERIAL NO. None

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL	0	0	0	0	0	0
CONTRACTUAL	0	0	0	0	0	0
SUPPLIES	0	0	0	0	0	0
EQUIPMENT	0	0	0	0	0	0
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS:	0	0	0	0	0	0
TOTAL OPERATING	0	0	0	0	0	0

CAPITAL	0	0	0	0	0	0
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CHANGE IN REVENUES ()	0	0	0	0	0	0
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FUNDING: (Thousands of Dollars)

1002 Federal Receipts	0	0	0	0	0	0
1003 GF Match	0	0	0	0	0	0
1004 GF	0	0	0	0	0	0
1005 GF/Program Receipts	0	0	0	0	0	0
1006 GF/MHTIA	0	0	0	0	0	0
Other	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

Estimate of current year (FY94) impact: \$ 0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS: (Attach a separate page if necessary)

Prepared By: Diane Schenker Phone: 465-3315/561-4426
 Division: Office of the Commissioner Date: _____
 Approved by Commissioner: J. Frank Prewitt, Jr. Date: 1-18-94
 Agency: Department of Corrections

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FISCAL NOTE

STATE OF ALASKA

BILL NO. SS HB 346

1994 LEGISLATIVE SESSION

Revision Date: _____ Department Affected: Office of the Governor
 Title: "An Act amending the Alaska Election Code and the Alaska Uniform Vehicle Code to conform them to the requirements of the National Voter Registration Act of 1993...and providing for an effective date."

BRU: Division of Elections

Component: Elections

Sponsor: Representative Ulmer

COMPONENT SERIAL NO. 21

Requestor: _____

EXPENDITURES/REVENUES:

OPERATING	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00
PERSONAL	49.2	49.2	49.2	49.2	49.2	49.2
TRAVEL	30.0	30.0	20.0	13.5	13.5	13.5
CONTRACTUAL	7.8	8.2	8.6	9.0	9.5	9.9
SUPPLIES	2.1	2.1	2.1	2.1	2.1	2.1
EQUIPMENT	0	0	0	0	0	0
LAND &	0	0	0	0	0	0
GRANTS.	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL	89.1	89.5	79.9	73.8	74.3	74.7

CAPITAL	0	0	0	0	0	0
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REVENUE						
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FUNDING:

1002 Federal	0	0	0	0	0	0
1003 GF Match	0	0	0	0	0	0
1004 GF	89.1	89.5	79.9	74.3	74.7	73.8
1005 GF/Program	0	0	0	0	0	0
1006 GF/MHTIA	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	89.1	89.5	79.9	74.3	74.7	73.8

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year (FY94) impact: 0

ANALYSIS: (Attach a separate page if necessary.)

Prepared by: Joseph L. Swanson, Director

Phone: 465-4611

Division: Division of Elections

Date: 2/10/94

Approved by Commissioner: John B. Coghill, Lieutenant Governor

Agency: Office of the Governor

Date: 2/10/94

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page 2 of 3

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO. ^{SS}HB346

ANALYSIS:

Personal Services (49.2)

Motor Voter Coordinator

Full time, permanent 16A located in Anchorage. Duties to include coordinating voter registration activities, prepare training materials, conduct training and periodic evaluation under AS 15.07.100, prepare forms, coordinate activities, mailing and procedures with voter registration agencies established under AS 15.07.075.

Coordinator will make recommendations to Director, agency and field offices that would be applicable under AS 15.07.075, and work with municipal agencies and private sector companies and organizations that would be interested in becoming a voter registration agency under 15.07.075.

Travel (30.0)

Field Travel - (21.0)

Registrar training at 400 state offices that provides services to the general public, and coordination of forms preparation and distribution state wide.

Conventions and Meetings - (2.2)

Annual National Voter Registration Act educational training and implementation meetings or seminars.

Per Diem - (6.8)

For trips listed above.

Contractual (7.8)

Advertising, Printing and Binding - (5.0)

10,000 registration form changes occur each month, which equals 120,000 per year. The Division anticipates that the National Voter Registration Act of 1993 will increase this amount by 15%. $120,000 \times .15 = 18,000$. However, this legislation requires a supply of registration forms to be provided at 400 state offices that provide services to the

page 3 of 3

FISCAL NOTE

STATE OF ALASKA
1994 LEGISLATIVE SESSION

BILL NO^{SS} HB346

ANALYSIS:

Contractual cont.

general public plus 1000 contracted agency locations which also provide services. The Division estimates a minimum requirement of 50 forms at each location (50 x 1400) or 70,000 new forms to be provided to these locations statewide.

Voter Registration forms are approximately \$72.19 per 1m (1000). $\$72.19 \times 70 = \$5,053.30$.

Postage paid envelopes needed for send backs (E-12)
\$143.50 per 10m envelopes $143.50 \times 2 = 287.00$
\$300.00 per 10m for printing $300.00 \times 2 = 600.00$
Total: 887.00

Postage - (1.8)

The Division anticipates approximately 1/3 or 33% of the increase (18,000) will need to be sent back to voters for additional information in order to process their voter registration form (send backs) $18,000 \times .33 = 5940$.
 5940 (send backs) $\times .29$ postage = \$1722.40
Postage Permit 75.00
Annual Postal Fee 75.00
\$1872.40

Supplies - (2.1)

Miscellaneous office supplies.

Five percent (5%) increase each subsequent fiscal year:

FY 96	8190.00
FY 97	8590.00
FY 98	9020.00
FY 99	9471.00
FY 00	9945.00

HR 346
MOTOR - VOTER BILL

FEB 18 1991

Sectional Analysis

- Section 1: Lists the information which must be included on a voter registration form.
- Section 2: Requires an applicant to provide any other name under which he/she has been registered.
- Section 3: Requires an applicant to provide information that will allow the registrar to determine where he/she is eligible to vote.
- Section 4: Requires every registration form to contain information regarding eligibility requirements and penalties for providing false information.
- Section 5: Sets out the requirements for registration by mail.
- Section 6: Requires applications submitted by mail to be postmarked 30 days before the next election; late applications will be placed on the master registration list for the following elections.
- Section 7: Requires an applicant to register at least 30 days before an election in order to vote in that election.
- Section 8: When an application is approved, the applicant will receive a voter registration card; his/her name will be placed on the master list and the district register. If an application is denied, the applicant will be informed of the reason for denial in a certified or registered letter.
- Section 9: (a) Lists the agencies where voter registration will occur:
Division of Motor Vehicles, Dept. of Public Safety
Public Assistance Offices
Office providing services to persons with disabilities
Recruitment offices of the armed forces
Other offices as designated
- (b) Requires the director to provide voter registration forms to each office where registration will occur.
- (c) Requires each of the designated agencies to assist their clients to register to vote and to provide registration services to any member of the public who requests assistance.
- (d) Requires agencies serving persons with disabilities to also provide voter registration services in the home.
- (e) Defines public assistance programs to include:
Medicaid
AFDC
Food Stamps
WIC
- Section 10: Requires the director to provide training to registration officials; outlines the time frames for submitting completed voter registration applications to an election.

- Section 11: Requires voter registration officials to be qualified state voters and to take an oath of office.
- Section 12: Sets out requirements for names to be included on the official voter registration list.
- Section 13: Sets out reasons why a name shall be removed from the registration list:
By request of the voter;
To comply with department regulations;
Death of the voter;
When the voter is convicted of a felony involving moral turpitude;
When the director determines the voter lacks the qualifications of a voter.
- Section 14: Authorizes the director to establish regulations for maintenance of the state official voter registration list and for removal of names from that list on a biennial basis.
- Section 15: Prohibits a registration official from seeking to influence a voter registration applicant from registering to vote; leading an applicant to believe that voter registration will have any bearing on the other services delivered by the office; or use the information for any purpose other than voter registration.
- Section 16: Sets out the circumstances under which a voter whose registration has been canceled may have a questioned ballot counted in an election.
- Section 17: Defines those records of the Division of Elections which are confidential; all other records are public records.
- Section 18: Provides for simultaneous application for a driver's license/identification card/vehicle registration with application for voter registration.
- Section 19: Requires timely forwarding of applications to the Division of Elections.
- Section 20: Provides that a change of address submitted for a driver's license shall serve as a change of address for voter registration.
- Section 21: Provides that a person's decision not to register to vote shall be confidential.
- Section 22: Repealers.
- Section 23: Requires this act and subsequent regulations to be submitted to the U.S. Department of Justice for approval.
- Section 24: Pertains to the duties of the Revisor of Statutes relating to this act.
- Section 25: Provides that nothing in this act addresses the handling and availability of records of the Alaska Public Offices Commission.
- Section 26: Immediate effective date for sections 23 and 24 of the act.
- Section 27: All other sections of the act take effect on January 1, 1995.