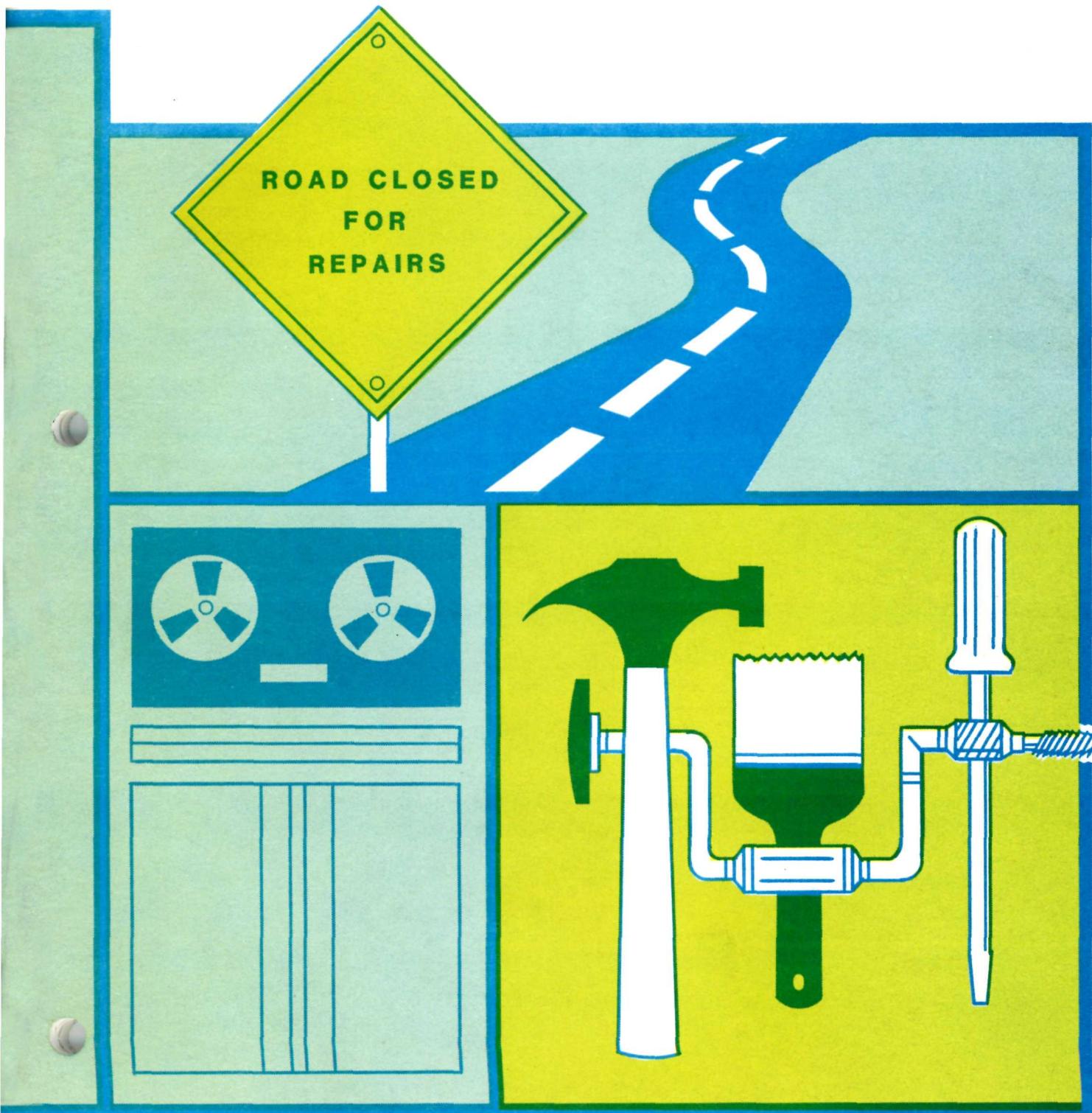


# Trends

Volume 19 Number 2 1982

## Trends in Maintenance Management

National Park Service and National Recreation and Park Association



## The Importance of Maintenance

by Russell E. Dickenson  
Director, National Park Service

In this time when the nation is attempting to balance budgets, economize and to continue to protect resources and provide for the needs of its citizens, we in the National Park Service have a special responsibility. We have been entrusted with a special stewardship. In addition to special care and management of natural resources, to preservation and restoration of cultural resources, we have a tremendous investment in the physical facilities essential to public use and enjoyment. A large percentage of our budget reflects this. Tight budgets in recent years have not always permitted us to maintain facilities as we would have liked. A large number of facilities date from the Civilian Conservation Corps, Mission 66 and other periods. Age is an important factor in their condition.

At this time it is especially important that managers utilize all of the tools available to assure that decisions are sound and that we are producing the best care possible to the natural, cultural and recreational resources.

This timely issue of *TRENDS*, while indicating many new and improved maintenance techniques, also demonstrates how much more complex maintenance management has become. Operational maintenance is totally dependent upon wise and informed preservation and preventative maintenance programs. Without these, operational maintenance quickly becomes overwhelmed and repair and rehabilitation costs preclude any programs related to economy, to preservation, or to visitor services. Our priorities and the priorities of the Interior Department reflect these con-

cerns and our support of the maintenance programs, including facilities rehabilitation. Informed maintenance management is high on our list of objectives.

We know it can best be achieved through qualified, well-trained staff, through a common understanding of objectives, and through management support of those factors that result in long-term economy. The articles in this issue provide the outline of a complex process. Various systems can reinforce each other. Good managers will adopt and utilize systems that have Servicewide application, knowing that local maintenance practice is totally dependent upon programming, budgeting and appropriation of funds. The OMB and the Congress can support us only when we can present a clear and justifiable case for our needs.



A publication of the Park Practice Program

The Park Practice Program is a cooperative effort of the National Park Service and the National Recreation and Park Association.

Russell E. Dickenson, Director  
National Park Service

John H. Davis, Executive Director  
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Membership in the Park Practice Program includes a subscription to all three publications and selected back issues in vinyl binders with indices and all publications for the calendar year.

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Articles, suggestions, ideas and comments are invited, and should be sent to Park Practice Program, U.S. Department of the Interior, Division of Cooperative Activities, National Park Service, Washington, DC 20240.

# Trends

Volume 19 Number 2 1982

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1957

1982

*Twenty-Fifth Anniversary*

# Introduction

by George Gowans

Maintaining park and recreation areas is a continuing challenge to managers throughout the federal, state, local and private park and recreation communities. Roads and buildings deteriorate, grounds must be mowed, hazardous wastes and often their containers must be properly disposed of. A myriad of situations must be dealt with that are necessary, time-consuming and, yes, that cost money, so that visitors to park and recreation areas can experience safe and enjoyable visits.

The National Park Service (NPS) recognizes that maintenance management has become increasingly complex and is striving to provide NPS managers with tools necessary to make sound decisions in their care of our nation's natural, cultural, and recreational resources.

The National Park Service's maintenance program activities can be divided into three broad categories: operational maintenance, utilities, and preservation/preventive maintenance. Each of these categories involves different concepts of skills, economics and planning. Each is influenced differently and can be affected in different ways. The objective in influencing each is twofold: to provide better service so as to meet maintenance objectives, and to do so at the least cost. This does not mean cutting costs by sacrificing either the maintenance management objectives or longer-term economy. Informed decisions at all levels are necessary to assure that these overall maintenance objectives are not sacrificed as a result of short-term budget decisions.

In this issue of Trends in Maintenance Management, a number of tools and processes are discussed that are being put to use by NPS managers to assure better use of limited funds.



Temporary laborer brush-cleans headstone at Shiloh National Cemetery in Tennessee.

National Park Service

Some of these permit decisions to be made with better consideration for future consequences. As these techniques can be better developed and used, they will be improved so that we will not have to continuously pay the price of ill-informed, short-term, budget-constrained decisions.

Operational performance guidelines—those pertaining to the operational maintenance category—must be developed and adopted at the park level. Some standardization is desirable, when possible, to permit region-wide and within-park evaluation, especially where unit costs appear to be outside of the normal range. Still, each performance guideline must be tailored to the park situation. For instance, mowing operations differ with the type of park area, location and season. Cleaning and trash removal depend on the season, number of visitors and the type of activity.

Operational maintenance comprises the large majority of the time and funding available for park maintenance. Savings in this category can be achieved by wise management decisions in establishing local performance guidelines and by efficiency in performing the work.

Utilities comprise another large component of the park maintenance budget. In recent years, energy conservation programs have done a lot to reduce these costs. Inflation, unfortunately, has more than overcome these savings. Future energy reduction opportunities will be more difficult to find and more costly to carry out. Careful review of energy retrofit project proposals will be essential to insure that decisions are made with the best long-term payback in mind.

Of primary interest, when considering economics of maintenance operations, are the preservation/preventive



Richard Frear

Home at Edison National Historic Site (NJ) shows signs of general deterioration.

maintenance programs. These usually receive the last priority for fund and time allocation for obvious reasons. Because they also often receive the least attention from management, many of the longer-term economies are overlooked. Decisions based on annual budget considerations also contribute to these losses.

A number of articles in this issue discuss ways to look ahead and alternatives that management can consider when allocating resources. Without due consideration for longer-term economics, short-range repair and rehabilitation costs continue to overshadow the entire program. This situation exists today throughout the country in roads, buildings, and equipment; wherever long-term considerations were overlooked in favor of short-term savings.

Not only must facilities deterioration be handled through preventive programs and through corrective rehabilitation, but needed improvements and modernization are essential to insure future operational economies. Within the National Park System there is a new awareness of these consequences. New programs are being reviewed and new methods are being considered that can assist managers in evaluating their needs in considering alternative solutions and in establishing priorities.

It has been six years since an issue of *TRENDS* focused specifically on maintenance. (See *TRENDS*, "Maintenance Management," Jan/Feb/Mar, 1976. Ed.) At that time a number of predictions were made concerning future maintenance requirements, methods and opportunities. They have proven to be reasonably accurate in many respects. This issue provides an

opportunity to look at maintenance as we begin the nineteen eighties. What effects have inflation and fuel conservation had? What is happening to the skills and abilities and numbers of the maintenance work force? What new responsibilities do managers have in their oversight of these programs? In their selection and training of maintenance managers and maintenance supervisors? How will maintenance programs be evaluated and improved?

From the articles in this issue it is evident that maintenance is still plagued with many of the same problems. However, it is also evident that progress is being made and that the world of maintenance is becoming more sophisticated. New management tools are being employed to inform and assist management. Computer



Charles Cadieux

*Using qualified, well-trained personnel is essential to effective maintenance.*

techniques, as predicted, are being used to collect and sort inventories, to transfer information over long distances, to provide code comparisons, to assign schedules and to develop priority lists. Accessibility to more information requires managers to develop and utilize systematic processes that assure consideration on all factors needed for decisionmaking.

Special studies of facility requirements, cost-effective solutions and life cycle costing are examples of methods that managers can use in their day-to-day decisions. Various parts of the

same organization utilizing common information sources can begin to function more effectively as parts of the same source. The National Park Service's Washington Office staff can better understand the Servicewide scope and magnitude of the maintenance program needs. This permits them to concentrate on better budget decisions and justifications.

As the full scope of the Maintenance Management Program becomes clearer, the roles and responsibilities can also be defined so that the NPS Washington Office can concentrate on policy

direction, the development of guidelines, and the establishment of Servicewide performance guidelines. Regional offices can concentrate on providing regional leadership and park support functions, and park areas can be free to make park operational decisions knowing the ground rules of expectations within which they can count on management support.

*George Gowans, Chief Engineer, is the Chief of the National Park Service's Maintenance Division.*

# A Project Evaluation Program

By Stanley Albright

A road reconstruction project in Grand Teton National Park, a maintenance chip-seal of a road segment in Chiricahua National Monument, and restoration of a decorative eagle at Independence National Historical Park need to be accomplished. Which project will receive the highest priority? A decision such as this is often made throughout the National Park Service (NPS), but often without considering all of the consequences and advantages of each project. A number of new systems and processes are now available to help NPS managers identify the full implications of each decision, and to help them choose alternative courses of action for each.

One such system is the Project Evaluation Program. This program is being tested within the National Park Service and has, so far, been found to have excellent potential. It can easily be adapted by other organizations merely by reassigning objectives and determining the significant factors that make up those objectives. The best decisions, as we all know, are those based on informed judgments. However, in today's complex world, data that can help make those better decisions are often complex and occur in overwhelming quantities.

Before describing the Project Evaluation Program, it will be helpful to briefly outline the kinds of information being made available to NPS management concerning park facilities, their numbers, their conditions and their requirements.

## Road and Bridge Inventory and Inspection Program

In July 1976, the National Park Service and the Federal Highway Administration (FHWA) entered into an agreement establishing the Road Inspection/Inventory Program (RIP). Based upon that agreement, the RIP provides a planning tool which iden-

tifies deficiencies, establishes priorities, and provides preliminary cost estimates for needed work. The need is based upon comparisons of existing conditions with standards accepted and agreed to by NPS and FHWA consultations.

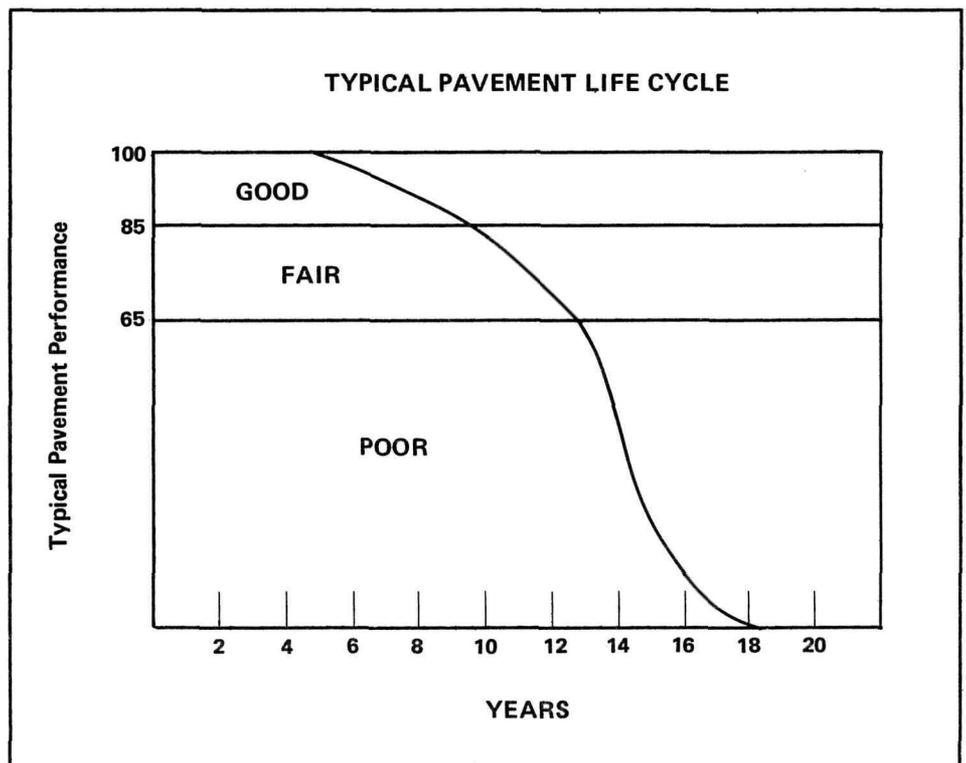
The concept of the Road Inspection/Inventory Program is based on (1) component standards jointly approved by NPS and FHWA; (2) a complete inspection and inventory of components with maintenance responsibilities (culverts, signs, guardrails, etc.); and (3) photologs of the entire NPS road system.

## Sufficiency Rating

Upon inspection, all road segments are assigned an overall sufficiency rating based on a number of component sufficiency ratings. In addition to consideration for type of road use and

road traffic volume, specific sufficiency ratings have been assigned to 4 elements within the pavement *structure* component, 5 elements within the roadway *safety* component, and 8 elements within the roadway *surface* component. The ratings, based upon specific calculations rather than subjective judgment, provide a uniform measure of road performance and road maintenance, reconstruction and construction needs Servicewide. This, then, provides NPS management with a decisionmaking tool for the determination of appropriate action such as path, seal, overlay, rehabilitation or reconstruction.

The following graph depicts a typical relationship between road condition and remaining useful road life. This cycle can be extended with the prudent use of cyclic preventive maintenance and rehabilitation.





Fred R.

NPS roads are inventoried and inspected to identify deficiencies, establish priorities and provide preliminary cost estimates for needed work.

## Typical Road Life Chart

The typical road life chart and the following description are based on a 20-year road structure life. The road structure is the road feature that has the greatest effect in determining the life of a road. It has been determined that the most cost-effective use of maintenance funding is during the "good" range (over 85% on the first portion of the road life chart). Patching and surface treatment in that range could easily bring the road condition back to a 100% road condition rating, thus extending the total road life for 20 years from that date.

The most cost-effective treatment for roads in the "fair" range (between 65% and 85%) is rehabilitation. Maintenance such as patching and sealing lasts only a short time and must be done repeatedly for continued safe road use.

Rehabilitation in the form of new surface treatment and corrections to the drainage systems are needed to bring the road back into the "good" range and extend the road's life.

Roads in the "poor" range (under 65%) cannot be maintained effectively at any cost. Patching that would normally last 8-10 years on a road in "good" condition may only last 2-3 years on a road in "poor" condition, and may require additional work within that timeframe. Reconstruction is the only cost-effective answer to roads in this category.

A thorough survey of all NPS roads has been completed. A preliminary analysis of the initial survey reveals that: based on road structure sufficiency ratings, 44% of all Service roads are in "poor" condition. Based on overall sufficiency ratings (including structure safety and serviceability),

38% of all Service roads are in "poor" condition. This indicates that responsible managers, based on need for serviceability and safety, must apply maintenance funds to repair roads that are in "fair" or "poor" condition rather than giving higher priorities to maintenance of roads that are in "good" condition.

The future condition of the roads will depend directly on the level of expenditures for reconstruction, rehabilitation, and preventive maintenance. Without definite action, the Service's roads will continue to deteriorate past the point where such low-cost solutions as patching and surface treatments are effective. Thus, it is apparent that the existing condition of NPS roads can be remedied by careful distribution of adequate funding to reconstruction, rehabilitation and preventive or cyclic maintenance, and

that expenditures early in the life of a road ("good" to "fair" range) will result in the most cost-effective use of maintenance funding.

### **Building Inventory, Inspection, Evaluation Program**

Inspection of 2,400 of the Service's estimated 16,000 buildings began in December 1981. This is the first phase of a 5-year program to inventory and evaluate the 16,000 buildings owned, operated or otherwise controlled by NPS.

However, since most older buildings, especially those used for overnight sleeping accommodations, do not comply with current modern-day codes, extensive rehabilitation or modification is usually required. Due to the cost of renovation and to the fact that many of these buildings are historic, it was necessary to seek other alternatives to the standards and codes used for new buildings.

In cooperation with the National Bureau of Standards (NBS), a fire code equivalency rating system is being developed for NPS. (See Harold Nelson's article in this issue. Ed.) This equivalency rating system will be used in the inspection/evaluation program to determine if a building complies with the *intent* of regulations for fire safety and is, in effect, a safe structure. The program is expected to provide a tool for determining alternative methods of meeting the intent of the codes.

To accomplish the inventory/evaluation, a computerized system will be used to store and analyze data which describes the building's dimensions, type of use, type of materials used in its construction and other unique characteristics. (Ed. note: This system is discussed in more detail by Donald Herring elsewhere in this issue.)

### **Water and Wastewater Program**

During FY 1978-79, a major program was initiated in conjunction with the Environmental Protection Agency (EPA) to inspect the wastewater treatment plants operated by NPS. The program included a comprehensive "hands-on" training program for NPS treatment plant operators. Through this program the NPS was able to evaluate its wastewater facilities program for their improvement and assure higher qualified operating personnel. At present all operating personnel are certified and licensed. Continued training is needed to update and improve their technical and management skills.

### **Curbing Pollution in the Parks**

Beginning in FY 1980, \$700,000 was authorized by Congress for "Curbing Pollution in the Parks." Through these funds, NPS has conducted studies and evaluations on various wastewater treatment plants and their sewage collection systems. These evaluations and programs have resulted in greatly improved operating efficiency and the correction of many plant or system deficiencies prior to major problems or system breakdowns.

Funds from the "Curbing Pollution in the Parks" program are also used to evaluate potable water systems and to make necessary minor modifications or repairs to ensure compliance with the Safe Drinking Water Act. A strict water quality monitoring program is administered by officers of the U.S. Public Health Service detailed to the NPS.

To further track and evaluate the efficiency and condition of Service-owned and operated water and wastewater systems, a computerized program is being developed to monitor efficiency, operating condition, and

compare the results with the discharge requirements established by the National Pollution Discharge Elimination System (NPDES) permit or water quality standards. The system, in addition to tracking efficiency and quality, will track repair costs, needs and operating expenses.

The system will provide to management, at all levels, information needed to evaluate the operating conditions, track costs, project future costs and schedule repair and cyclic maintenance. In addition, it will be a useful tool for NPS engineers to study the effectiveness of particular equipment and plant designs.

### **Concessions Facilities**

The Service, as the franchising agency for private operations within park boundaries, has to be concerned with the maintenance of concession facilities. In many instances, NPS actually owns the facility. In the remainder, the facility is owned in whole or in part by the concessioner.

Through a regular program of inspection, monitoring and maintenance activities, the Service regularly inspects both the concession operation and the facilities. This is especially important as the level of maintenance affects other park operations and sometimes it is necessary to purchase poorly maintained concession-owned facilities to achieve proper standards.

In addition to routine park inspections of kitchens and sanitary facilities, the Public Health Service regularly inspects those facilities and provides reports to the concessioner and to the park staff.

NPS safety officers, mechanical, electrical and structural engineers and sometimes local fire marshalls are utilized to assist with sound recommendations. The NPS Building Inspection

Program, discussed earlier, will include inspection of concession facilities in order to assure NPS managers that the safest conditions exist, and assist in recommending priorities for repair and rehabilitation work.

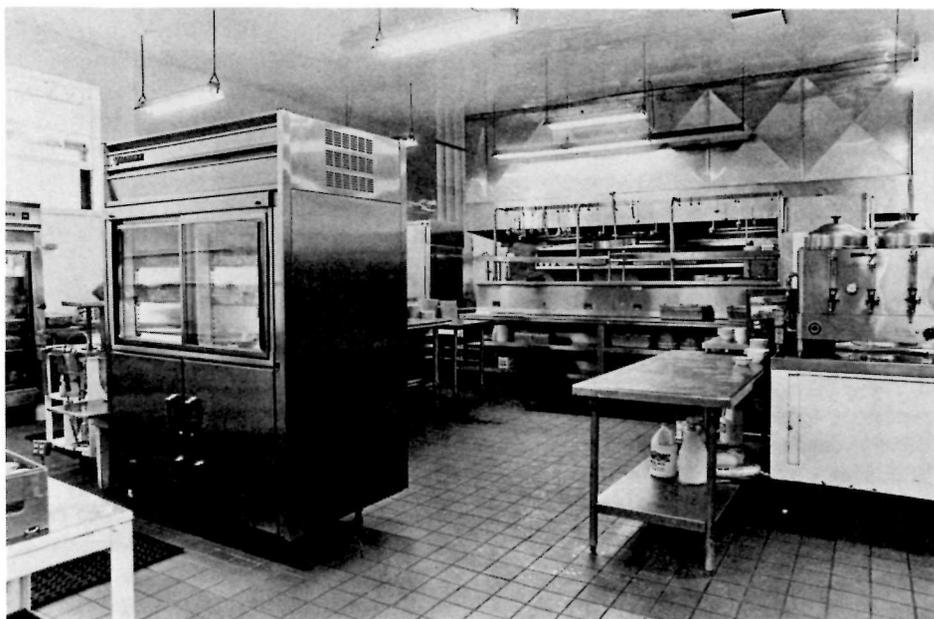
## Evaluation and Priorities

More complex? The more we know about facilities, it seems, the harder the job of management. Does this mean poorer decisions? No, but it does mean that we often have more information than we can rationally use. The National Park Service's *Project Evaluation Program* has been designed to help cope. It has not been designed to replace managers or to make the decisions for which managers are responsible. How does it work and what does it do for management?

By entering certain facts into a computer program, priority values can be assigned to each proposed project. The project can be compared to other projects and managers can then assess the various projects as they appear on a common priority list. Let the computer decide what is important to the National Park System? No. Let managers determine what is important and then ask the computer to help identify those projects that have the characteristics judged to be most important. The Project Evaluation Program is still undergoing some fine tuning. As additional types of information become available through the various inventory/evaluation programs, the Project Evaluation Program will be modified to consider additional factors.



Richard Frear



Richard Frear

*Through a regular program of inspection, monitoring and maintenance activities, the National Park Service regularly inspects both the concession operations and the facilities such as the gift store and lodge kitchen at Grand Canyon NP (AZ).*

## How It Works

A project can receive up to 1,000 points. 35% or up to 350 points are assigned in Phase I based on the objective to be achieved. A fixed list of objectives is offered for selection. There are 20 in the program today. These range among preservation of a natural resource, preservation of a cultural resource, reduction of a health hazard, provision of more visitor conveniences,

or reduction of operational costs. Any repair, rehabilitation or construction project may be entered but it will also handle additional concerns such as a new employee or a new operational program. The highest values, up to 350 points, are received based on the points previously assigned to the program by a wide variety of park officials. These have primarily included field employees with their operational needs.

## Phase II

The following selection of the primary objectives, Phase II of the program, based on the original objective selected, determines an appropriate subroutine and offers additional questions for consideration. If the primary objective relates to economics, the subroutine questions relate to cost-effective payback periods or life cycle cost considerations. Objectives related to cultural resources trigger a subroutine related to the class of the resource. Safety or health objectives call up questions related to the risk involved and to the number of persons subjected. Up to 350 points can be assigned based on the factors in Phase I.

## Phase III

Phase III, the final 300 points, provide for more refined information such as number of people affected or number of people who might be involved in an

incident. There is also an opportunity to add or subtract points based on additional management judgment. It is first helpful to discuss how the system will be employed.

Park managers will be the primary users of the systems. If properly utilized, there will be little need for involvement at Regional and WASO levels. After entering the factors, the park manager will receive a listing of the park project, ranked in descending order of points. Knowing that although the computer has considered far more factors than normally reviewed, the park manager will also know that a number of factors, especially those that pertain only to that park area and therefore not common Servicewide, have not been considered. The manager will then renew the listing to assure that the ranking appears to be in a realistic order. The manager can question those projects that appear to be in the wrong sequence. Perhaps it is a more important cultural resource; perhaps a lesser cost-effectiveness based on the information supplied. Information, if found in error, can be resub-

mitted. Also, points can be added to a project to accommodate the local conditions such as a highway being rerouted, a statewide celebration nearby, a contractual commitment or important interest on the part of support groups. These conditions must be documented to inform the Regions and WASO of the deviation from the standard program. This permits Regional monitoring and an opportunity for the Regional office to better understand and justify these special projects.

## Conclusion

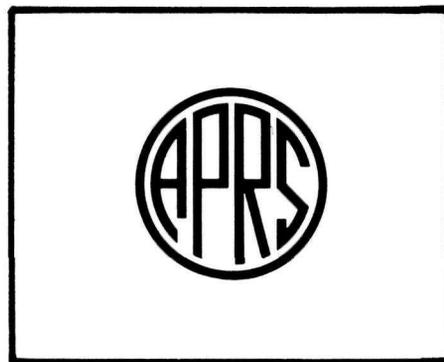
As always, managers will make the decisions. The computer merely sorts and evaluates the factors that identify those projects that best appear to match the managers' objectives, and then permits managers to consider those additional factors that they are paid to consider.

*Stanley Albright is Associate Director for Management and Operations of the National Park Service.*

## Maintenance Standards

### A Report from the National Society for Park Resources and the American Park and Recreation Society

by Arthur T. Wilcox



For longer than the professional lifetime of many park and recreation administrators, park management has thrived in an environment of relative prosperity. Concern for planning, growth and development of new facilities and services to meet ever-increasing and varied public demands tended to overshadow the critical importance of on-going, never-ending maintenance.

Good park maintenance has always been recognized as the hallmark of a sound park and recreation system. The events of the past five years have served to emphasize its critical importance in maintaining sound programs in the face of rising costs, lower tax supports and widespread public insistence in controlling government spending. The highly publicized 1978 Proposition 13 in California and current shifts in funding sources from one agency to another tend to hide the fact that drastic spending limitations in many forms have taken place throughout the country and at all governmental levels.

It was with this in mind that two branches of the National Recreation and Park Association (NRPA), i.e., the National Society for Park Resources (NSPR) and the American Park and Recreation Society (APRS), appointed a joint committee in 1979 to identify and coordinate the wealth of maintenance know-how in their memberships and take steps to provide ways to improve maintenance practices throughout the country.

A survey of the membership determined the initial objectives of the committee and identified those interested in contributing to the committee effort. Over 600 people are now actively involved in some aspect of the work.

This is a continuing volunteer effort by park professionals interested in

improving professional practices. This report is an invitation and a plea for all interested people to contribute to the work of any branch of the committee.

The committee has established a central address where all information is recorded and sent to appropriate committee members. This is:

The Park Maintenance Standards Project  
Colorado State University  
233 Forestry Building  
Fort Collins, CO 80523  
(303) 491-5126

Attention: Arthur Wilcox, Co-chairman for NSPR, or  
Ron Donahue, Co-chairman for APRS

The committee's direction has been influenced by several important considerations:

1. For practical reasons, activities are restricted to the general area of outdoor park maintenance.

2. As with many volunteer professional organizations, the most active and valuable members are already dedicated, hard-working, and often overworked contributors to their profession. Thus, committee results are sometimes slow, unpredictable, sporadic, and opportunistic—but sound and permanently valuable in meeting long-term objectives.

3. There is great danger in "reinventing the wheel." The committee attempts to integrate with already established practices, stay away from areas where substantial literature and knowledge already exists (sports areas, pools, paving, buildings), and take advantage of the great fund of knowledge now available but not widely known.

4. There are many in-house publications of great value designed to solve local problems or provide uniform practices for large organizations. Some could be made selectively available through an information distribution system. Some cannot be widely distributed.

One such publication is an excellent "nuts-and-bolts" manual on "Cleaning Recreation Sites" by the U.S. Forest Service. In an outstanding example of agency-professional society cooperation, this has now been reprinted by the NSPR and is available at low cost from the National Recreation and Park Association. (See "Who Can You Turn To?" in this issue. Ed.)

5. It is apparent that "standards" may develop slowly, but most important now are short publications that spell out principles of maintenance management and design for maintenance. Further, the professional park administrator needs information to help him "sell" the importance of maintenance to his employers, his public, and his own employees.

A committee survey indicated six areas where initial work would be most effective. It soon became apparent that one of these—maintenance management systems—is the subject of a great deal of current study and publication. It was decided that no good purpose would be served by further study at this time.

Development of a publication, *Design for Maintenance*, was directed by Gerald Coutant, Regional Recreation Director for Region 8 of the U.S. Forest Service, Atlanta, Georgia. Aided by a grant from the former Heritage Conservation and Recreation Service (now National Park Service), his committee made national surveys, collected data, and produced the publication which is available from the NRPA.



Ralph H. Anderson

*Maintaining clean sites is a continuing challenge to park and recreation personnel.*

This publication emphasizes the importance of incorporating maintenance considerations into all aspects of park planning and design, and the critical importance of the maintenance staff in contributing to all steps in planning and development. (See "Who Can You Turn To?" in this issue. Ed.).

The remaining committee projects are an on-going volunteer effort and all interested parties are invited to contribute and communicate with the appropriate chairmen.

### **Maintenance data collection and retrieval**

Tom L. Davis  
State Recreation Extension  
Specialist, Colorado  
The Park Maintenance Standards  
Project  
233 Forestry Building, Colorado  
State University  
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A computerized information storage and retrieval system has been established for all information sent to the project. The system is capable of storing and generating abstracts or complete texts. Information can be retrieved by a keyword system utilizing the U.S. Forest Service documentation program "Famulus." All information is recorded and a microfiche copy made. Plans are now underway to make this material generally available at cost. More contributions are necessary before this is done.

## Standardizing classification and terminology

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Champaign, IL 61820  
(217) 333-1824

Ed Harvey  
Director of Operations  
Champaign Park District  
706 Kenwood Road  
Champaign, IL 61820  
(217) 352-0071

Great variations exist among park management agencies in the way maintenance practices are classified. A uniform classification system is necessary in order to keep comparable records, identify levels of maintenance required to meet varying management objectives, and to realize maximum use of effectiveness of maintenance standards. A suggested basic classification system is being printed and will be available for review by all known interested park professionals.

New words, word combinations and terms are constantly being added to our professional language. Some of these mean different things in different places. A glossary of terms relating to park maintenance is being printed and also will be distributed to all known interested park professionals for review. The glossary includes:

1. General maintenance
2. Grounds maintenance
3. Vegetative maintenance
4. Facilities maintenance
5. Natural resource maintenance
6. Legal terminology of maintenance.



Fred E. Mang, Jr.

*Facilities must be maintained to provide safe conditions for park visitors and employees.*

## Maintenance safety standards

James Bossi  
Developed Recreation Site Specialist  
U.S. Forest Service  
P.O. Box 2417  
Washington, DC 20013  
(202) 447-2311

Information is now being gathered and it is expected that a workshop will be held within a year to produce a manual on safety as it relates to maintenance and especially to liability problems in park operations. This is a very important but difficult area with which to work, and assistance is especially welcome.

## Uniform measurements for maintenance production

Theodore Haskell  
Associate Professor  
Dept. of Parks and Recreation  
Resources  
Michigan State University  
East Lansing, MI 48823  
(517) 355-1855

This is a major committee effort now in the process of collecting and analyzing materials from all interested parties.

\* \* \*

The interest of park personnel in all parts of the country has made this committee assignment unusually exciting and worthwhile. It is hoped that this will continue and broaden in order to give proper recognition to the vital area of park and recreation administration.

*Dr. Arthur T. Wilcox, Department Head of Recreation Resources at Colorado State University for sixteen years, was formerly Director-Secretary of the Akron, Ohio Metropolitan Park District, and chairman of park administration at Michigan State University. He is a vice-president of the NSPR.*

# Conflict—Security vs. Life Safety

by Quinton Y. Lawson

Does a conflict really exist between security and life safety or is this just a perception in the minds of those individuals responsible for these disciplines?

The dictionary defines conflict as "to come into collision; clash or be in opposition; to contend; do battle." As a manager of a park facility, sometime in your professional career you have faced security and safety situations where one of those terms seems appropriate.

No matter from whose point of view the problem is seen (security or safety), the responsibility is always the same, i.e., the protection of people and property, in that order.

The major area of concern in the security-life safety dilemma seems to be that the security people want to lock the doors of facilities to provide security, and the life safety people want to keep them open to provide adequate means of egress. At the present time there are no standards or guidelines approved by any regulating body that would meet the requirements of both disciplines.

Why do we need standards and guidelines to lock doors? Because the building exits and stairwell doors are being barred, chained, locked, nailed, blocked, and enclosed in violation of all known safety regulations.

Too much safety can create a security hazard and vice versa. However, there is a point where safety and security are compatible and balance each other. It is at this point that the safest possible environment is provided for all.

A first step toward resolving the life safety-security problem in buildings is the recognition that there is no such thing as 100% safety or security, either from fire or from acts of violence. We should not consider ourselves in an either-or situation, but in a situation by which we as security and safety professionals find compatible answers to the dual crime and fire safety problem.

While there has been practically no loss of human life in federal buildings from fires, primarily because they are not used as overnight facilities, the problems of homicide, rape, assault, and thefts have reached epidemic levels in government office buildings. The distribution of protection resources needs to be re-evaluated. Along with this increase in criminal assault is the problem of decreasing manpower. Whether it is attributed to budget cuts, the increase in the cost of each security officer or just increased workload, the fact remains that there are fewer people to do the job. Today one 24-hour post in a federal building can cost as much as \$80,000 per year. In some states and local governments, this cost can run as high as \$100,000 per year.

In seeking a solution to the security and safety problems that will meet the needs of all persons who work in or visit public facilities, one must take into account future budgetary constraints as well as a decreasing work force. It would seem that with past experiences and future considerations, the task seems almost insurmountable. Here are some points that should be considered.

## Life Safety and Security Seminar

Under the sponsorship of the U.S. Fire Administration's Federal Facilities Design Standards Task Group, a seminar was proposed and held at the National Bureau of Standards, Gaithersburg, MD, on July 14, 1978. The theme was "To Lock or Not to Lock—Balancing Needs of Occupants' Safety and Security." The large number of safety and security professionals that attended the seminar (almost 400 people) indicated the interest of the security and safety community in this problem. The objectives of the seminar were to:

1. Provide a basic understanding of the major problems which evolved from considering security and life safety goals for a building.

2. Discuss the present day technology and alternative approaches to satisfy basic requirements of security and life safety.

3. Summarize what was accomplished by the seminar and indicate possible future actions.

The highlights of the seminar were as follows:

1. Many management people lack fire knowledge and experience, and place the probability of fire occurrence very low. They are not aware of how fast a fire in a building can make it untenable, and how low the human tolerance is for smoke and fire-generated toxic gases. The life safety problem in buildings, whatever their size, can be stated as "time to safety."

2. A major current problem is the use of exit facilities by persons with hostile intent to enter and easily egress from buildings. As a result, security people have insisted on locking the exit facilities. This is contrary to the intent and needs for life safety. Two conflicting safety interests for people in buildings have developed: (1) safety of the individual from hostile actions, and (2) safety of the group from fire. These two areas of interest must be reconciled to achieve the acceptable levels of life safety and security protection.

3. At the present time there are some *ad hoc* solutions adopted by various federal agencies to interface the life safety and security requirements. However, these solutions are not fully satisfactory. Therefore, guidelines and standards must be developed by groups who are familiar with both views of the problem.

The recommendations resulting from the topics presented by 10 experts in the fields of security and life safety, and the question and answer period following the presentations were given to the Federal Facilities Design Standards Task Group to be implemented. The recommended actions taken are as follows.

## Recommendations

1. Prepare a letter to the National Fire Protection Association giving a statement of the problem and suggesting necessary changes to the Life Safety Code.

2. Suggest that a member, or members, of the security community become members of the National Fire Protection Association's Life Safety Code's Sectional Committee on Means of Egress. Also, at least one qualified person shall be nominated for consideration.

3. Send a copy of the letter indicated for item 1. above to the Occupational Safety and Health Administration, U.S. Department of Labor, requesting that they comment on, and consider adoption of the proposal.

4. Furnish federal agencies a copy of the proposed guideline changes submitted to the National Fire Protection Association, and background information, for their information and use.

## Life Safety Code

All of the proposed recommendations made in 1978 have since been implemented, and many of these changes have significantly impacted on the security and life safety problem as outlined in this article. The most important change that has taken place was the change in the Life Safety Code dealing with means of egress. Prior to this change in the regulations, the exit doors

were allowed to be secured on the outside of the building as long as a means of egress was provided for on the inside of the building. This was usually in the form of some type of panic hardware that would allow anyone on the inside of the building to egress at any time by applying pressure to the panic bar opening the door. Inside release hardware comes in many different forms. Some are standard door release hardware (panic bars), some incorporate alarm devices that sound a loud alarm when activated, and others are push button devices. There are many other exit devices used on doors but all of these devices, from a security point of view, have one major weakness, i.e., they provide an easy path of ingress or egress for persons that would commit a crime or an act of violence in the building. If we apply this criteria to our special security requirements for libraries, museums, and historic buildings we find an extremely weak link in the security program.

One example of this weakness is illustrated by the following case: A library at an eastern university was losing its collections at the rate of 1500 volumes a month through doors required for egress which permitted students to by-pass the checkpoint. Library security personnel met with the state fire marshal who is responsible for state buildings. They devised a method of locking the exit doors and still providing safe egress during emergency conditions. Their problem loss through these exits has dropped to zero. In another case a museum's rare and very valuable jewel-encrusted sword was stolen by the act of breaking the glass in the case and fleeing through a fire exit to the street. By the time the security force had arrived in response to the security alarm, the thief had fled.

These examples have been used to demonstrate how vulnerable a public building can be to acts of crime and violence through the use of exit doors. Obviously, some sort of compromise was required that would provide for the safety of people in the building during emergency conditions allowing safe egress, and yet provide for the security of the building and its occupants as well. The one idea that seemed to serve both disciplines was that during an emergency condition, i.e., fire, emergency evacuation, etc., the door locking device would provide immediate, safe egress from the building. At all other times the device would provide a time-delay factor that would delay the opening of the door by a given time factor. The task group proposed language to the Life Safety Code committee that would provide for this type of delay, yet would still meet the requirements for safety and security.

The following excerpt is from the 1981 Life Safety Code:

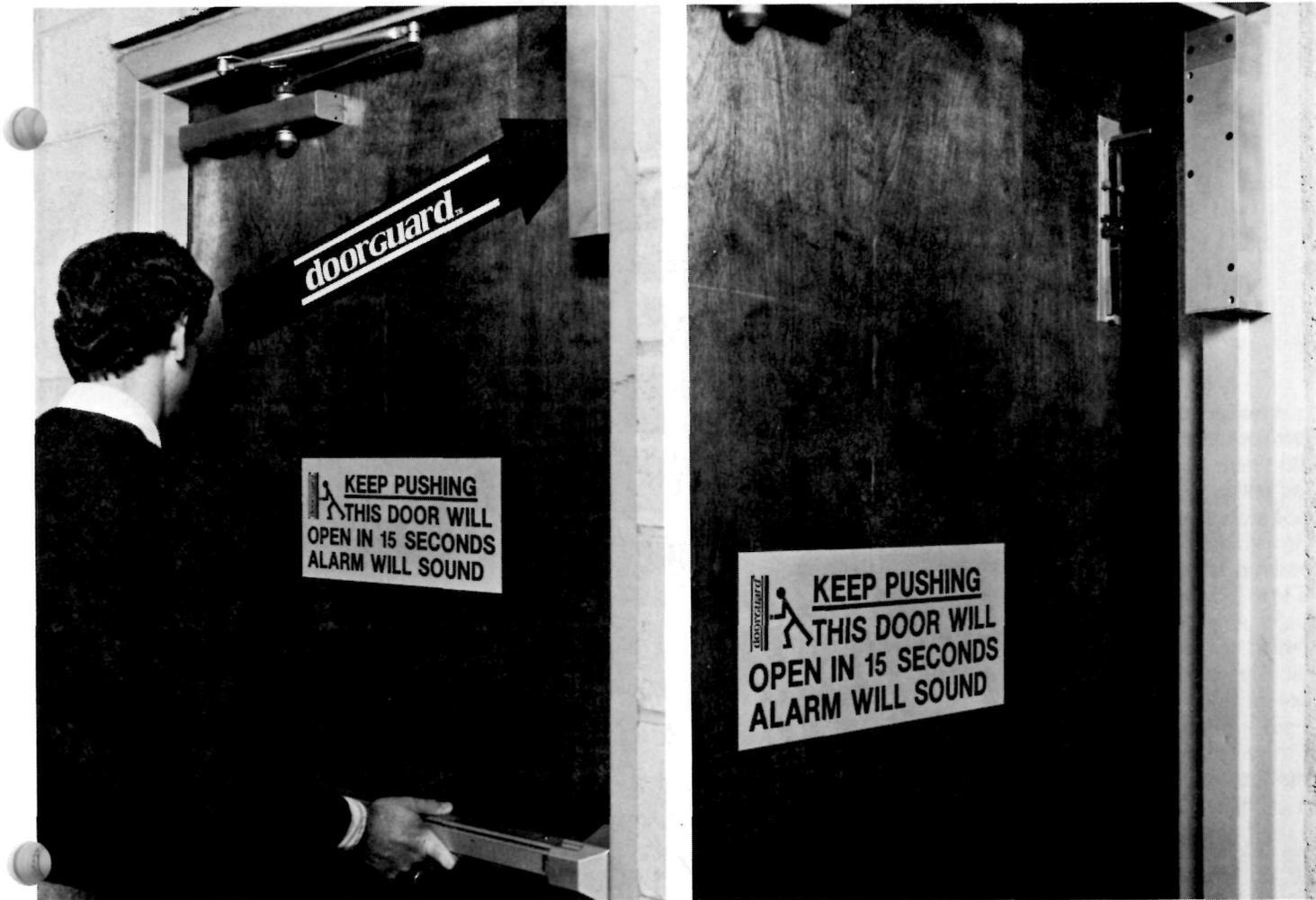
### 5-2.1.2.1.5 Special Locking Arrangements.

5-2.1.2.1.5.1 In buildings protected throughout by an approved supervised automatic fire alarm or automatic sprinkler system and when permitted by Chapters 8 through 30, doors in low and ordinary hazard areas, as defined by 4-22, may be equipped with approved, listed, locking devices which shall:

(a) Unlock upon actuation of an approved supervised automatic fire alarm system or fire extinguishing system installed in accordance with Section 7-6 or 7-7, and

(b) Unlock upon loss of power controlling the locking device, and

(c) Initiate an irreversible process which will free the latch within 15 seconds whenever a force of not more



The design of Doorguard places door control with the individual attempting to egress the building.

than 15 pounds (66.72N) is applied to the release device required in 5-2.1.2.1.2 and not relock until the door has been opened. Operation of the release device shall activate a signal in the vicinity of the door for assuring those attempting to exit that the system is functional. Exception: The authority having jurisdiction may approve a delay not to exceed 30 seconds provided that reasonable life safety is assured.

5-2.1.2.1.5.2 Signs shall be provided on the door adjacent to the release device which read:

"KEEP PUSHING. THIS DOOR WILL OPEN IN 15 SECONDS. ALARM WILL SOUND." Sign letters shall be at least 1 inch (2.54 cm) high.

Most people would say that a 30-second time delay is not much of a security factor. However, to a thief committing a crime, 30 seconds seems like an eternity. Most criminals plan for an escape route. If no quick egress can be planned, then the chances are that

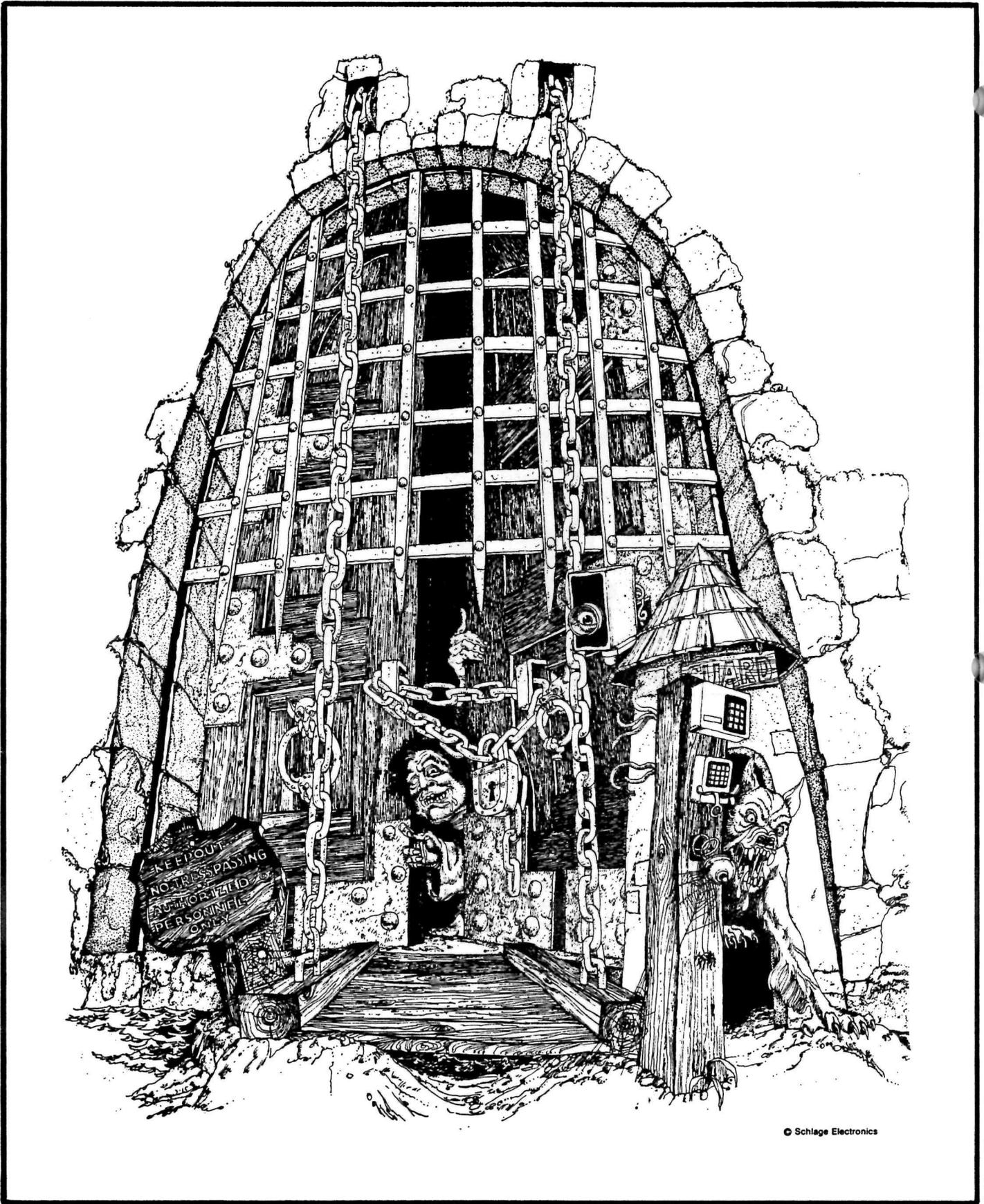
the crime will not be committed. The psychological effect of a loud bell ringing and a locked door would be too much for most criminals. In the case of libraries, museums, and historic buildings, this type of device will be invaluable in stopping the smash and grab, and other crimes that are committed because an easy method of egress was available.

### Exit Door

One manufacturer has placed on the market an exit door called "Doorguard" that meets the new requirements of the Life Safety Code dealing with egress. The key element in the design of this type of device is to place the control of the door with the individual attempting to egress the building and not under the control of some remote security station in the building, but also providing the sentry station with adequate time to respond positively.

In the event of a system failure, emergency override modes have been provided for. They are:

1. Activation of a central alarm system (smoke, heat, fire, sprinkler) will immediately inactivate Doorguard and allows unimpeded egress.
2. Loss of power immediately inactivates Doorguard and allows unimpeded egress.
3. An independent and redundant hydraulic override system will allow the door to open in 30 seconds when 15 pounds of pressure are applied to the panic hardware in the event that all other emergency overrides fail. Regardless of the number of doors or zones controlled for a multi-door system, the sequence of events remains the same as well as the functional control available from the sentry station.



© Schlage Electronics

The security-life safety dilemma.

### Sequence of Events for Multi-door System

Elapsed time	Action sequence
1. 0 seconds	- panic bar activated - sentry station secure light on (green)
2. 3 seconds	- local alert activated - sentry station alert activated - sentry station trigger light on (yellow) - sentry station secure light on (green)
3. 15 seconds	- Doorguard releases and door opens - sentry station alert continues - local alert continues - sentry station secure light off (green) - sentry station trigger light off (yellow) - sentry station unlocked light on (red)

NOTE: Until Doorguard keeper is re-engaged for 10 continuous seconds, the local and sentry station alerts will continue sounding, and unlocked light (red) will stay on.

4. 25 seconds	- Doorguard resets and sentry station secure light on (green) - local and sentry station alerts stop - sentry station unlocked light off (red)
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NOTE: If pressure to the panic bar is removed or interrupted before Doorguard releases to open door at 15 seconds, the timing sequence repeats.

### Conclusion

The problem of controlled egress is not the only problem safety and security professionals face. As in so many other fields, more open communication between the individuals responsible for these disciplines will significantly contribute to the safe and secure environment for everyone involved. There are few other areas where professionals are as dedicated as they are in the fields of safety and security. The responsibility for the protection of people is an awesome undertaking. Protection is the responsibility of security and safety professionals, not as individuals, but as a dedicated group of people working for the benefit of others.

*Quinton Y. Lawson is Director of Support Services Division, Office of Federal Protective Service Management with the General Services Administration. He has lectured extensively on all phases of security to government and industry, and is a member of the American Society for Industrial Security.*

# Adaptive Use of Cultural Resources

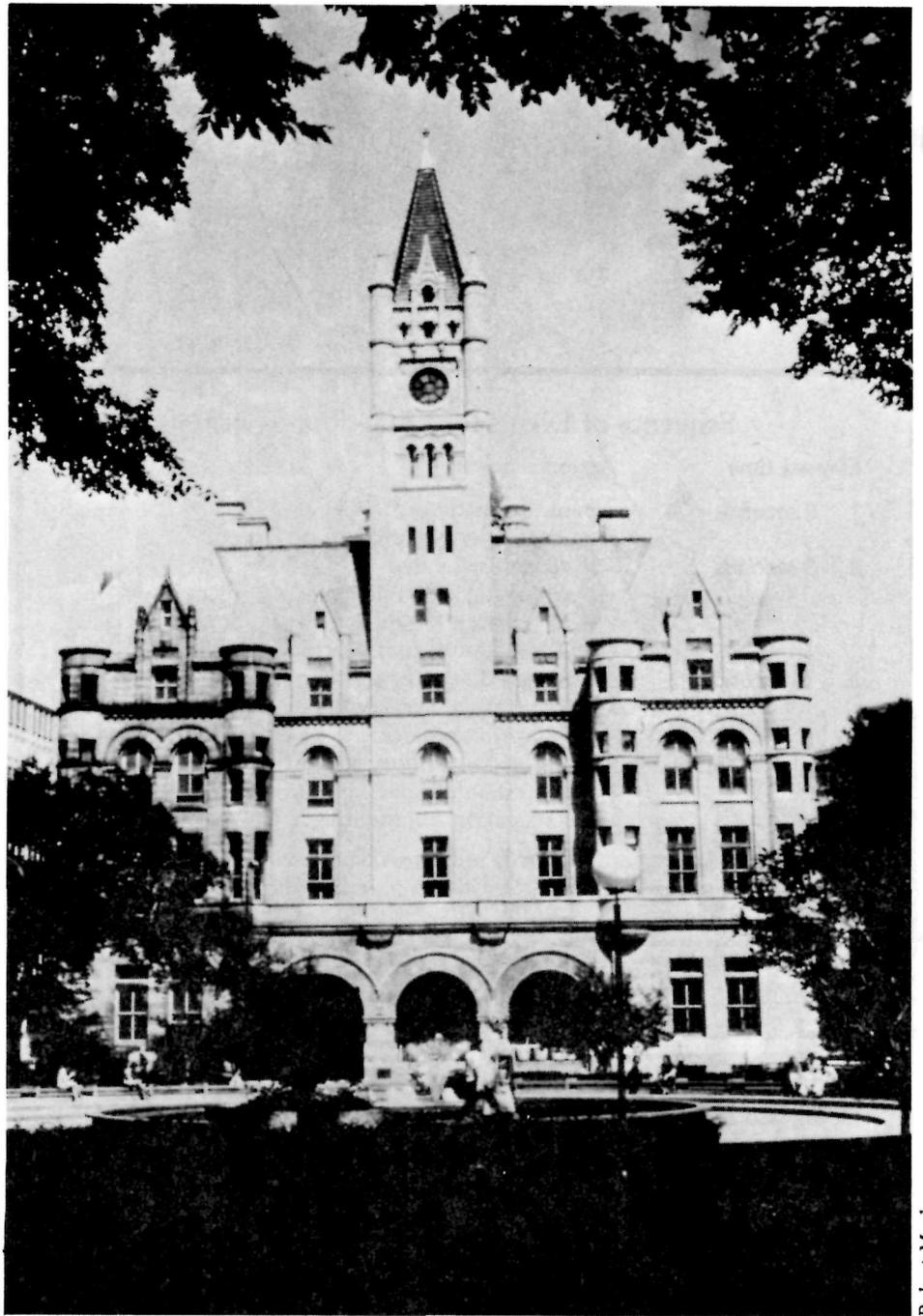
by Hugh C. Miller

*"Historic properties on island within commuting distance of downtown. Available for long-term lease and development. Interested parties should contact National Park Service."*

This is an advertisement that might possibly be seen in a real estate classified section of a newspaper resulting from recent legislation which authorizes government agencies to lease historic properties for adaptive uses. Adaptive uses of cultural resources may sound to some like blasphemy or sheer abandonment of the responsibility of stewardship. However, it is not a new idea in National Park Service cultural resources management. The current adaptive use furor is a result of everyone in the historic preservation movement getting on the bandwagon, and the idea has captured the imagination of free lance writers and the mass media.

Cultural resources, for this discussion, are described as prehistoric or historic sites, structures and objects that are usually in public ownership. Cultural activities like the performing arts are not included here. For simplicity we will not consider objects of adaptive use. Adaptive use can be defined as the new use for a site or structure other than that for which it was originally intended.

In the strict application, most park prehistoric and historic sites and structures are adaptively used by the very nature of their being in public ownership and accessible to the public for enjoyment. The management of cultural resources can be considered as the management of change. The change can be measured on a scale from little change such as the continuing use for modern needs or actual restoration, to a period for interpretation (in most cases interpretation is a new use), to major change for totally different uses requiring some modification of the site or structure.



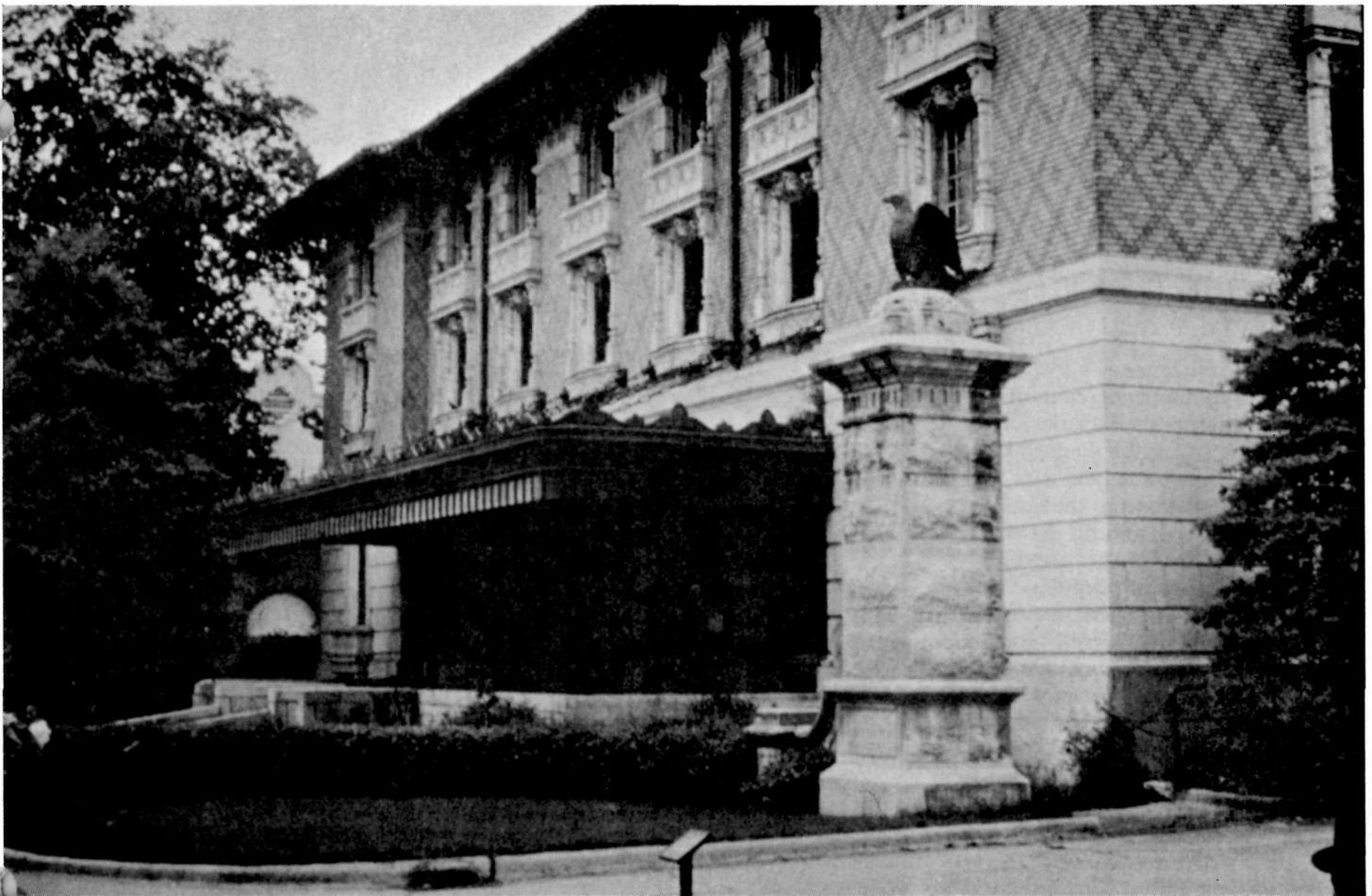
*The old Federal Court Building in St Paul (MN) was converted into a city center for education and the arts in 1972.*

Robert Mack

A road, parking lot and visitor center at Chaco Canyon National Monument in New Mexico are certainly facilities for new uses at this archaeological site. The conversion of the Second Bank of the United States into a portrait gallery certainly required some changes of the historic structures to accommodate the display lighting and environment for the paintings. Both these modifications were planned and the impact on the resource

considered. Management decisions to implement the work were made with full belief that the basic values of the resource would be left unimpaired.

Understanding the values of the resources is critical when one is considering adaptive use for cultural resources. In planning terms these can be analyzed as the characteristics and limitations resource. Simply stated, "what does the resource want to be"?



Henry Judd

*The Fordyce Bath House in Hot Springs NP (AR) has good potential for adaptive use.*

## Narbonne House

A case in point is the proposal some years ago to convert the Narbonne House at Salem Maritime National Historic Site, Massachusetts, into an employees' quarters. Built in 1670, the Narbonne House is a remarkable survival of a very small house with its framing system and much of the original interior fabric intact. However, the doors, hallways and winding stairs are very narrow. The early 20th century conveniences were jammed into the shed and attic in such a manner that they would not meet modern codes or family use requirements. In fact, it was the mechanical, electrical and plumbing systems that became the "no-go" factor.

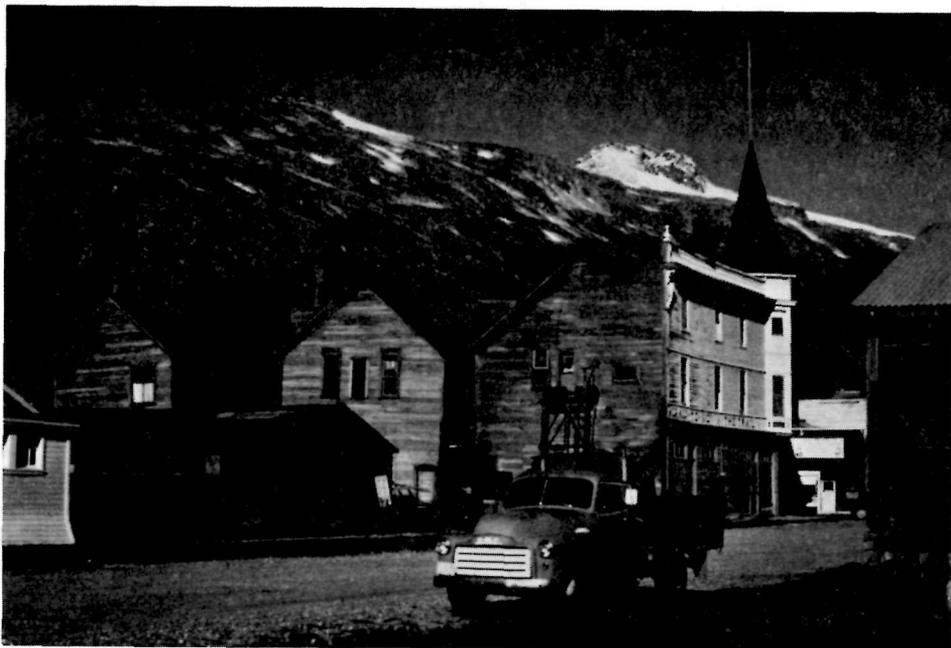
The small size of the five rooms and exposed framing system limited the location of risers and runs for utilities to such an extent that the designs were unworkable without major alterations and additions to the house. At this moment the house "spoke up." It was evident that the only reason that it was in public ownership was that the Narbonne House was one of the few buildings with a plan type and framing system so typical in the 17th century to survive into the 20th century. When this fact was recognized, it was apparent that the continuing use as a residence in the late 20th century was not suitable. Thus, the characteristics and the limitations of the Narbonne House dictated suitability of the proposed use. The feasible treatment became apparent and the house has been structurally stabilized and the fabric preserved. It is now part of the historic landscape with limited interpretation of the interior.

## Historic Landscapes

The characteristics, limitations, suitability and feasibility of the use of a cultural resource can be analyzed critically in such a manner that the variations on the preferred use will become apparent. The visual aspects of sites generally are the key resource features. The landscape is maintained as a total environment of natural and manmade features. The management of historic landscapes tries to establish these features in the historically accurate context for the period of the time significant to the park's theme.

At Gettysburg and many other battlefields, terrain, vegetative cover, field use, roads, fences and farm buildings make up the historic landscape base.

Superimposed on these is a memorial landscape of monuments, cannons, tour roads, and interpretive facilities. Since it is not suitable or feasible to maintain an appearance of the battlefield as it was during or after the battle, the landscape is maintained in agricultural use as it was before the battle. This land is prime for leasing for agricultural purposes. Many times these leases are restrictive for certain requirements for crops. . . corn in the historic cornfield, peaches in the historic peach orchard. In most cases good modern farm practices with modern machinery are allowed. Sometimes there are restrictive clauses in the lease not to overload the barn with bales of hay. Usually modern agricultural structures like ceramic metal silos are not permitted. Thus, there is a continued use of the land in a historic context but adaptations for modern farm practices are permitted. The land is managed by a private lease holder under general direction of the National Park Service.



*The character of this gold rush town in Klondike Gold Rush NHP will be preserved by public and private effort in the adaptive use of buildings.*

## Cultural Landscapes

In park areas where there is no direct association with an historic event or a significant person, the history of the area is probably depicted by a continuity of use. This is the case in the historic zones of areas like Cape Cod National Seashore (MA), Delaware Water Gap National Recreation Area (NJ-PA) or Buffalo National River (AR) and when landscapes and scenic values are enumerated as part of the enabling legislation, such as at Cuyahoga Valley National Recreation Area (OH). For management purposes these can be designated as cultural landscapes. These cultural landscapes have values that are

perhaps best maintained by continuing private use under easement or by leasing for an acceptable use to maintain the natural and manmade features and protect the cultural values.

The same approach would be followed with historic structures. Buildings are preserved or restored to maintain their appearance at a moment of time such as the "event" of the signing of the Declaration of Independence or as they were during the life of an important person such as Franklin Delano Roosevelt. Aside from these "event" buildings and biographical homes, many historic properties are used adaptively by the National Park Service for their own purposes. These are art galleries, exhibits and interpretive audiovisual rooms in historic buildings. Historic structures are used for park management, quarters and maintenance facilities.

## Planning and Design

The impacts of the change of use on a cultural resource is a planning and design analysis problem. New uses may change circulation patterns, parking requirements may increase, commercial or industrial use may require new truck-loading or trash removal capacity. Access and egress for life safety and handicap must be considered. These can be looked at as "maybe yes and maybe no" solutions based on the resource and the requirements for use. There may be many excellent and acceptable solutions to these problems. The solutions are limited only to the imagination of the planners and designers. But there are times when there may be no acceptable solutions, and the proposed use will have to be modified or changed.

Building envelope modifications are important. In the preservation of the building's architectural character and long-term performance, it is essential to consider the impacts of cleaning and pointing, masonry, reroofing, window retrofits and repairs, and energy and mechanical systems requirements.

### Cultural Resource Maintenance

The maintenance of cultural resources is basically the same regardless of use.

Some of the most typical treatments can also be the most serious. Cleaning and repointing of masonry structures are ordinary processes that can drastically change the character and physical performance of the building if not appropriately planned and carried out.

Abrasive cleaning (sand blasting) is so destructive that it is not permitted to be used on most historic structures. Portland cement mortars are not recommended for repointing since they are too hard and too waterproof. Modern materials like caulking, when used in lieu of a mortar, may also be too waterproof and cause masonry units to spall. The application of waterproof coatings on masonry may actually set up a chain of events that causes the masonry surface they are supposed to protect to deteriorate. It is evident that each maintenance activity is a problem-solving exercise that is complicated by the use of the individual building and its historic design and materials.

Substitute materials may or may not be acceptable for the initial treatments for an adaptive use or preservation plan. At Independence Hall, special castings of replacement wood carvings for the clock case mounted high on gable end of the building were made in bronze reinforced polyesters. This was an acceptable substitute since the molds were custom made from castings based on historic

documentation and using materials with a long life. Maintenance performance was a factor in this selection of a modern material. The use of metal or vinyl clapboard as a substitute for wood is not acceptable since the profiles and details do not follow historic methods or details. The performance of these light weight materials is questionable since the finishes and the surfaces are easily damaged and impossible to repair.

### Increase of Historic Structures

In the past decade the National Park Service has grown enormously. We have added literally thousands of National Register-caliber historic structures to our care. Gateway National Recreation Area (NY-NJ) has over 200 major buildings at Sandy Hook, one of several units of the park, and Golden Gate National Recreation Area (CA) will eventually have over 1,000 historic structures. Cuyahoga Valley National Recreation Area (OH) has untold numbers, and the National Capital Region (DC) has over 1,000 such buildings. Cap Cod National Seashore (MA) is well represented as are Harpers Ferry National Historical Park (MD-WV), Hot Springs National Park (AR), and Delaware Water Gap National Recreation Area (NJ-PA).

In addition, there are numerous parks such as Buffalo National River (AR), Blue Ridge Parkway (NC-VA), Point Reyes National Seashore (CA), Cape Lookout National Seashore (NC), Cumberland Island National Seashore (GA), and Gulf Islands National Seashore (FL-MS) with historic structures. Many of these historic structures are being only partially used.

There is much that can be done today to avoid the abandonment or underutilization of these historic buildings. The abandonment of such structures is detrimental to the preservation of the building and should be avoided. Today, there are several existing laws and

policies that can be used to provide adaptive uses for these threatened edifices.

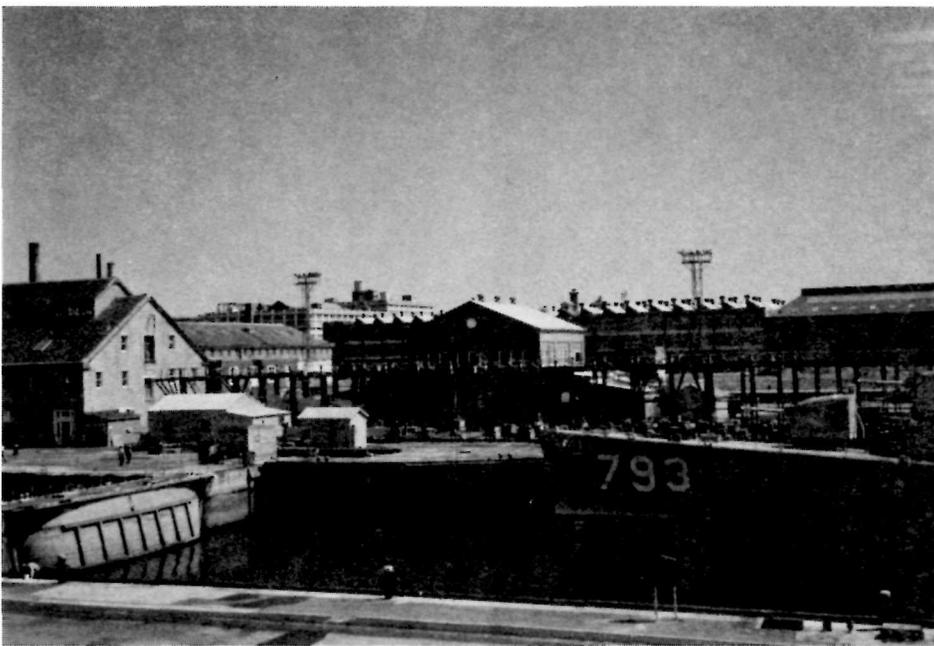
### Leasing Park Property

Generally, the principal reason for preserving these structures is to maintain their exterior and, thus, preserve the historic sense of the place. Interior spaces of the great majority of these structures could be used for any number of purposes without destroying the fundamental purpose for their preservation. The National Park Service now can rent small or large structures to private individuals or commercial interests for shops, boutiques or office space.

Public Law 96-515 authorizes the sale or lease of property acquired by the National Park Service when that property is not immediately required for park programs. The use of this property for non-park purposes must be in a manner that is consistent with the purpose for which the area was authorized by Congress. The property may be "leased back" for a long or short term.

A short-term renewable lease could keep present owners or tenants in an historic property until NPS planning is completed and final use is determined and funded. Long-term leases can provide occupancy and maintenance for those historic structures not needed for immediate park use. The receipts from the leases under this new law can be used for administrative purposes and maintenance of these structures.

Other authorities can be used for adaptive use. Special use permits can be given under general authority for the adaptive use of portions or all of a historic structure by non-profit groups, cooperative activities, etc. This method of using historic structures is limited only by imagination and common sense.



Charleston Naval Shipyard (MA) includes historic display structures (foreground) and conversion of other buildings (background) to housing and other commercial uses.

Hugh Miller

## Concessionaires

The Concession Policy Management Act (Public Law 89-249) established a system for providing public accommodations, facilities and services that are necessary and appropriate for the public use and enjoyment of national parks. Under these provisions, the National Park Service is authorized to contract for those services deemed desirable for the park visitor. Historic buildings can be made available to concessionaires. NPS policy, after all, encourages adaptive use of historic structures.

## Cooperative Agreements

The NPS can also enter into contracts (Public Law 91-383) that allow for cooperative agreements for living exhibits, interpretive demonstrations and park programs. This legislation also allows the NPS to sell at fair market value products and services produced in the conduct of these activities. Proceeds are credited to the appropriation bearing the cost of such exhibits and demonstrations. This authority can be imaginatively applied to historic structures in national parks, recreational areas and historic sites.

## Housing of Government Employees

The housing of government employees (Public Law 88-459) in historic buildings is another adaptive use to be encouraged. Rentals reflect current market conditions adjusted by the amount of preservation and/or other costs, such as extra fuel, that the lessee provides. Monies from this source are returned to the park maintenance fund. Rental fees charged to employees of cooperating agencies (e.g., Eastern National Parks and Monuments Association employees, and other units that have a written cooperative agreement) using NPS buildings for quarters also can be returned to the maintenance fund. However, when historic structures are used as quarters, any limitation on funds for repairs or alterations to these quarters should apply only to the non-historic portion of the structure.

## Surplus Historic Federal Buildings

The adaptive use of surplus Federal buildings that are historic is of particular interest to state and local officials and private investors. It is possible for GSA, with approval of the proposed rehabilitation and use by the National Park Service, to transfer historic properties to a state or local government for adaptive use. The Federal Building in St. Paul, the first major transfer of this type, was converted into a city center

for education and the arts in 1972. Since then, many local governments have accepted deeds to historic federal lands and structures and rehabilitated them for new public uses . . . offices, museums, recreation centers, playgrounds and parks.

In other cases these transferred properties are leased to private developers. Recently the 1877 Customs House in Nashville was declared surplus and the title was transferred to the city and court government. The metropolitan government of Nashville and Davison County then leased the building for 50 years to a group of private investors. Customs House Associates has now rehabilitated the building for commercial office space.

The developers restored about 30% of the building to its 1877 appearance. The remainder was converted to modern office space to meet tenant needs and the intent of life safety codes. Since this work complied with the Secretary of the Interior's Rehabilitation Standards, the developers were able to take a five-year depreciation under the provisions of the Tax Reform Act of 1976. This amortization of the improvements over a 60-month schedule made the conversion of the Customs House economically feasible and the leasing of the office competitive with the newly constructed offices.

The arithmetic for adaptive use is enhanced even more under the recently enacted tax act that will allow a 25% tax credit right "off the top" for the rehabilitation costs of certificated historic properties. The economics of using existing buildings is better than ever! The preservation and use of historic buildings not only makes sense as conservation of cultural resources but, often with adaptive use, it is good economics.

*Hugh C. Miller, AIA, is Chief Historical Architect of the National Park Service.*

# Procedures and Requirements for a Facility Inspection and Inventory Program

by Donald Herring

Inventories are frequently viewed as time consuming and costly. This is quite true in most cases. However, if properly developed and updated they can save considerable time and money, plus be a very powerful tool for managers.

All too often an inventory is requested in order to serve one purpose only. Then they are performed in a hurry but do not relate to a greater or overall management purpose. Unless some permanent, multipurpose use is made of these, they can be considered "bean counting" exercises. When one measures benefits versus the costs, they are probably the most expensive inventories in the long run.

## Functional Inventories

A functional inventory examines an entire management unit and subdivides it into its various elements which are necessary for its continued usefulness. Picnic tables, for example, are an essential part of a picnic area or campground, but they are only a small portion of the management unit as a whole. What about the rest of the site, i.e., the restrooms, fire pits, garbage cans, signs, trailer dump stations, etc.?

To know that an area has 100 picnic tables tells you little about the management of the area. What is the visitor season, how many tables need replacement or painting, are they wood or steel? A functional inventory describes the unit, evaluates its condition and identifies its deficiencies.

Managers of park areas today are facing a real challenge - budget cutbacks, loss of personnel—and these come at a time when public expectations are for even greater service. Now, more than ever, it is necessary to realistically look at efficient utilization of resources, alternatives and improved methods for economics in management.

One place to begin is to get a good understanding of the conditions and needs of facilities. These facilities probably require a greater expenditure of cash and manpower every year than any other feature in a park area.

To inspect and evaluate a building for its deficiencies and needs is not an easy task. It is not difficult to count the number of buildings in an area or even to determine how many need paint, a new roof or carpeting. But for how many of those buildings can continued use and repair be considered cost-effective? A functional inventory should tell you if they comply with fire/life safety codes, if they are accessible, the condition of the electrical wiring, and if they are energy efficient. These are the real factors which go into the management of buildings.

## Inventory Components

In order to effectively perform a functional inventory of a building, the following should be evaluated:

- a. The site
- b. Site improvements
- c. Exterior structure
- d. Mechanical plumbing
- e. Mechanical - Heating, Ventilation, Air Conditioning (HVAC)
- f. Electrical - service and distribution
- g. Passageways - exterior doors, windows
- h. Passageways - interior doorways, stairs
- i. Interior - ceilings and walls, and wall coverings
- j. Interior - floors, support and features
- k. Interior - appliances and appointments
- l. Foundation

Each of these components should be evaluated or "tested" against a standard (i.e., fire codes, plumbing, etc.).

## Building Use

The use of the building, however, greatly influences which standards apply. For instance, a hotel must comply with different standards than would a museum. Therefore, it is first necessary to identify the building's use, or the use of various subsections within a building.

Eight major sufficiency elements govern a building's use, establish priorities and control its management:

- a. Fire safety
- b. Public health
- c. Handicapped accessibility
- d. Structural soundness
- e. Mechanical reliability
- f. Electrical service
- g. Energy efficiency
- h. Maintenance condition

## Inspection/Inventory

After the use of the building has been determined and the applicable codes identified, the actual inspection/inventory can proceed. It should be organized in a logical manner to reduce the need for the inspector to "back-track" in and out of the building or from room to room.

To accomplish this, inspection forms should be devised so that each feature of the building is listed in a logical walk-through pattern and all components for each portion identified and evaluated (i.e., all elements of the front side should be grouped, then the left, back and right sides), permitting easy "walk around" of the building exterior only once.

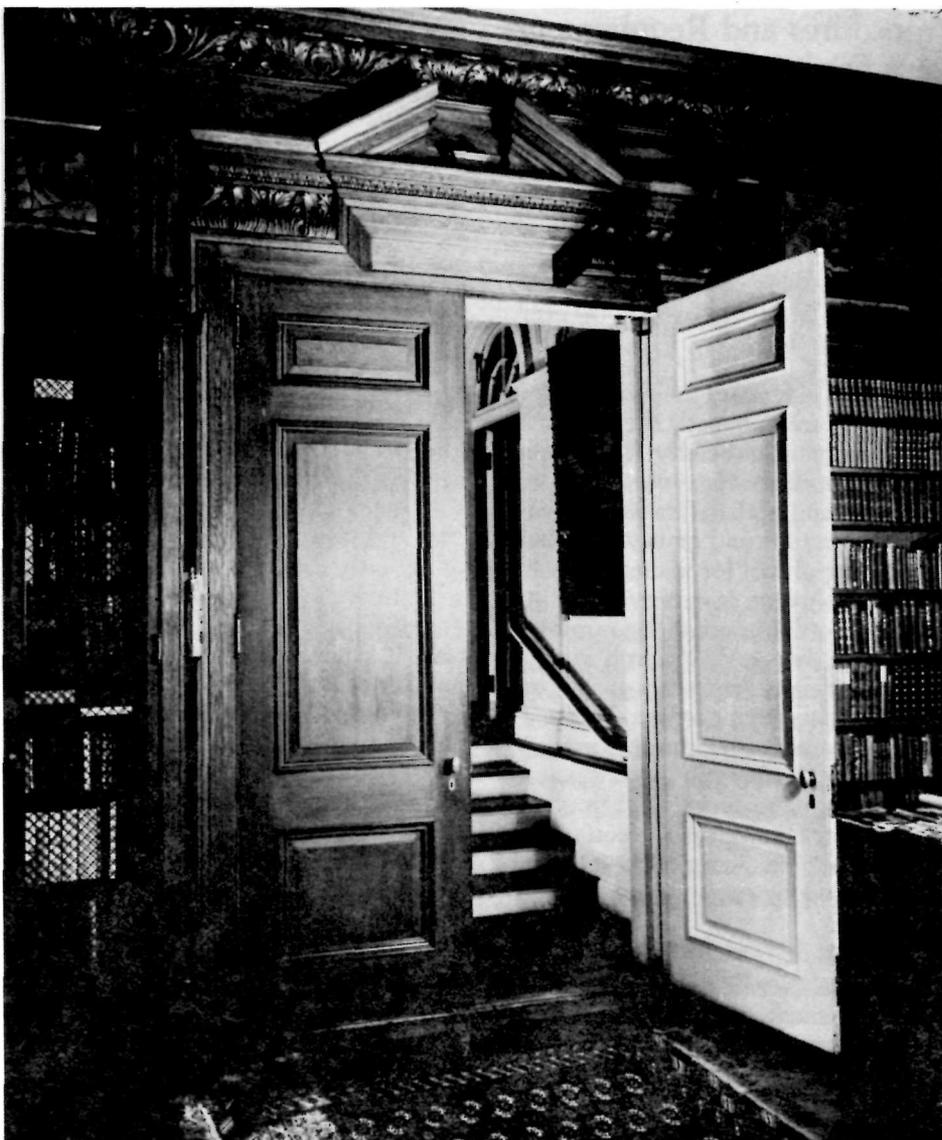
## Computer Application

The National Park Service has recently implemented such an inventory system for the 16,000 plus buildings it manages or owns. The system utilizes a computer to store the building and construction information and generate the needed inspection forms, and to estimate the costs to repair or replace deficient elements.

The inventory/evaluation procedure consists of (1) the floor plan of the building which is "digitized" with the "X-Y" coordinates stored in the computer for future retrieval, permitting a printout drawing of the floor plan on the building report, and (2) each area or subsection of the building identified by its use. Other information pertaining to climate zone, year constructed, building materials, square footage and number of months open is also entered. From this information and from the listing of building codes and regulations stored in the computer, inspection forms are generated which are unique for each building.

The forms are printed and used by a team of inspectors for the evaluation of each facility. The inspection results will then be entered into the computer for further analysis to generate various reports for cost estimating and budgetary purposes or other specialized reports.

Photographs will also be taken of each building for future reference. By evaluating the total structure as a unit, multiple questions can be answered about a building. By computerizing the information, it can be easily updated, and special inventory requests can be satisfied without re-inventorying each building.



*Interior doorways and stairs are evaluated when conducting a functional inventory of a building.*

## Cost Data

After determining the condition of each element in the various categories and determining if the element complies with applicable regulations, cost data will be generated based on local prices for all elements and categories.

These costs will also be compared to the cost for total replacement of the building. This will provide the manager with a cost comparison between repair/rehabilitation or total building replacement, and it will demonstrate what percentage of the costs are associated with each priority (i.e., life safety, health, electrical, etc.).

By breaking down costs into these elements, a manager can better plan and schedule repair, rehabilitation and maintenance, and can further evaluate the current or proposed use of the building. In some cases it may be far more cost-effective to change the use of the building rather than make necessary modifications, or it may even be more practical to demolish the building.

*Donald Herring is the Building and Utilities Specialist in the National Park Service's Maintenance Division.*

# Risk Management

by Robert D. Espeseth

If this is your first encounter with the term "risk management," you are not alone. The subject is new to many public officials and employees. Risk management is a term attached to that part of management's responsibilities dealing with protecting a government's or government agency's assets and resources against possible loss. A *liability* can be described as an ever present "state of being liable" to a peril, force or event which confronts persons and/or property. Presence of a liability implies exposure to a peril, force or event capable of causing or contributing to a loss. Existence of a liability generates a *risk* for the government agency. The risk factor is present because one is just not sure: (1) whether the liability will materialize into a loss; and (2) if so, how devastating the loss will be. The risk, or uncertainty of loss, is what all government agencies must learn to manage.

Personal and loss-threatening risks are present everywhere in life. We are liable, and therefore face risks, if we are responsible for the welfare of children, the safekeeping of tax money, the incarceration of prisoners, the proper driving of our vehicles, the payment of a mortgage, or the maintenance of structures, facilities, equipment, roads, etc., in park and recreation areas, and so forth. As members of families, groups and government agencies, we have certain threatening liabilities for which one shares responsibility. The risk of losses is painfully present in multiple forms, including the human, psychological, physical, financial and the less tangible loss of public trust or confidence. In response to their potential we devise methods to construct a less vulnerable



The general deterioration and needed replacement of furnace equipment makes NPS liable for this building it owns.

Richard Frear

environment or one providing at least a feeling of security. We purchase insurance, erect flood walls, hire park and recreation personnel, police and fire personnel, install safety glass, devise contingency plans, implement controls on pollution, and retain attorneys, to name only a few.

Local officials and administrators are constantly bombarded with a growing number of risk related responsibilities. The courts, legislatures and citizens have placed added chores upon governmental officials. Drinking water, dismissed employees, health and working conditions, traffic control, civil rights, and pollution are examples of these new and

important duties. Adequate guarantees that these responsibilities will be met are best afforded through aggressive applications of risk management techniques.

Risk management involves the identification of an agency's or organization's risks and the use of one or more techniques to evaluate, control and administer them. The process is hardly a science with precise methods to achieve known outcomes. To the contrary, the *management of risk* is an art requiring plenty of give and take. Although the art of governmental risk management is a relatively recent phenomenon, the practice has been recognized in the private sector for many years.

## Insurance Policies

The single most common technique in both sectors was, and remains, the purchase of insurance policies. As a result, a sizable part of the risk management process is the constant re-examination of insurance needs and the constant review of maintenance practices, operational procedures, and program evaluations which have a direct or indirect influence on the insurance program of your agency.

Risk management is probably one of the few functions involving considerable portions of tax dollars still performed mostly on an *ad hoc* basis. When you add every insurance cost, plus related expenses, the total cost to the taxpayer may be surprising. Therefore, a greater share of management's attention should be devoted to this branch of administration in the future. Generally, we must begin to exercise creative judgment and institute flexible actions to better guard against this growing number of potential liabilities. Some of these options may include:

- training of employees
- safety programs
- loss prevention
- retention of risks
- pooling risks
- contract review
- enlarging insurance deductibles

With risk management planning your agency has choices before losses occur, and greater control if they do occur. Risk management planning involves four phases: identification, evaluation, methods, and administration.

Park and recreation agencies with substantial insurance premiums and with sufficient available personnel are advised to carry out the complete process. Those agencies would then be best able to adopt improved ways to protect against risk. Other agencies, on the other hand, may find it advantageous to identify the risks and immediately begin to implement methods for reducing or controlling these exposures.

### PHASE I - How to Identify Risks

Pertinent to any effort at risk management planning is the identification of risk exposures faced by your agency and its personnel. The collection and subsequent analysis of exposure information is critical (1) to avoid overlooking any potential risks; (2) to minimize the impact of loss, should one occur; and (3) to prevent loss where possible.

Without a doubt, the identification of a large number of potential risks is a challenging and complex process. As a result the identification phase should be in writing and well organized. The identification phase will reveal that an agen-

cy is faced with numerous types of risk exposures including property, liability (contractual and tort or personal) and fidelity risks.

### Property Risks

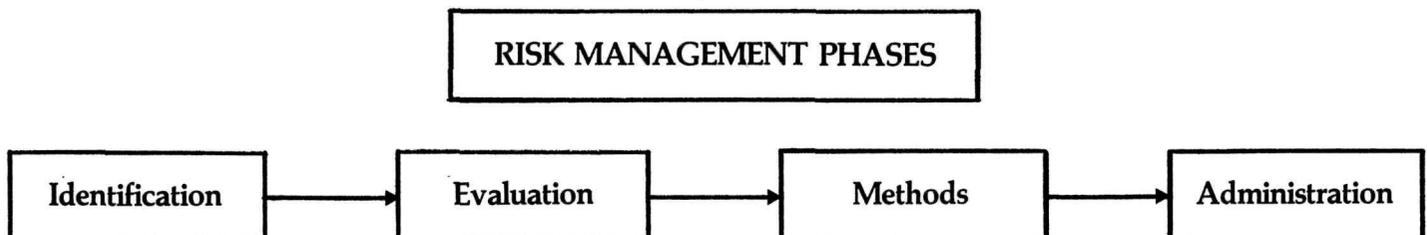
Property risks are highly visible and easily identifiable subjects such as recreation facilities and equipment, buildings, vehicles, etc. These facilities are exposed to loss through fire, vandalism, storms, negligence, floods, explosion and utility shutdowns, to name a few.

### Contractual Liabilities

Contractual liabilities are the legal requirements stipulated in contractual obligations. If contractual terms are not met, or are violated and damage results, a potential liability arises.

### Tort Liabilities

Tort liabilities are complex and probably more dynamic in change than their contractual counterparts. Tort liabilities are the alleged actions or inaction of public officials or personnel from which a civil suit can be brought by an aggrieved individual or group. Torts to which personnel may be exposed range from improper maintenance, improper signing, errors in omissions, job discrimination and many others. Historically, govern-





Richard Frear

Managers of this congested storage area face property risks.

ment agencies have been immune to most tort claims but these immunities are being eroded and can no longer be considered absolute.

### Fidelity Risks

Fidelity risks are those associated with tax and revenue receipts as well as those related to the fidelity of employees handling these funds. Samples of fidelity risks are: (1) any dishonest or inappropriate appropriation or use of public funds; (2) any losses which result from forgery or alteration of a check or draft of the agency; (3) losses through the failure of any employee(s) to properly perform accounting duties related to governmental funds or property; (4) any loss or destruction of money or securities due to theft, fire, etc.

### Risk Exposure Survey

To accomplish the complete listing of property liability and fidelity risks, several techniques are available. A written checklist or survey is foremost among these methods. The agency can obtain a listing of risk exposures by utilizing a survey. All activities, properties and other resources should be included on the survey form. Key personnel are then verbally asked to list questions on the survey. The results serve as a basis for decisions in risk management problems.

For example, areas where safety or disaster action plans are needed may be isolated and preventive efforts then initiated before an accident or disaster occurs. A follow-up training program to instruct officials and employees on their responsibilities will help to supplement this type of program. Furthermore, the survey and subsequent risk evaluation will assist the agency in

making decisions on whether to buy more or less insurance, to pool resources, to initiate a theft and vandalism awareness program and retain acceptable levels of loss.

Remember, those involved in the survey must be aggressive in completing the surveys. They should probe hidden areas where the agency may be liable, but make it clear that the purpose of the survey is not to analyze anyone's job performance. It is to determine where actions need to be taken to reduce liability. After the surveys are completed it may also be necessary to utilize field visits to gain additional knowledge and record worthwhile observations if additional elaboration is needed.

Once all written material has been gathered you should list all risk exposures for use in the second phase of evaluation. It is often helpful to group these under workable subheadings such as property liability and fidelity.

The identification of risks must be an on-going activity as new facilities, activities or events occur. At least once a year an updated re-survey effort should be made. It is also important to assign the re-survey task to the individual who will work closely with your program throughout the year. This on-going responsibility is critical to establish continuity and cooperation within all aspects of a risk management program. Once the identification process is completed, your agency will have a better idea of its risk exposures and liabilities. When the list has been completed the evaluation of these risk exposures can begin.

## PHASE II—Evaluating Risks

Risk evaluation is a necessity but is not an easy task to accomplish since each risk has different probabilities of occurrence as well as varying impact severities. The end result of the process is a rating of each risk exposure from high to low frequency of probability of occurrence and you can attach a potential severity in dollar terms. When this phase is completed you can begin to apply tailor-made solutions to specific risks.

The process of evaluation in measuring property liability and fidelity risk exposures is difficult and perhaps the most imprecise step in the risk management process. Since each of these risk areas has unique contributing factors, the techniques used to measure their respective frequencies and impacts vary somewhat from one another. There are numerous approaches to evaluating risk frequencies and forecasting severity potentials ranging from simple evaluations to very complex statistical manipulations. Therefore, while more sophisticated agencies and companies may utilize complicated formulas and statistical

manipulations, there are procedures designed to assist the efforts of smaller governmental agencies as well.

### Frequency Estimation

The estimation of a frequency or occurrence rate can be a difficult task. Several records provide starting points to estimate the number of times or probability that a particular loss may result. A review of past loss histories, which can be obtained from existing records or from your insurance company, is the key element in this step. Records which indicate past loss history should be analyzed for a minimum of the past three years.

### Worth Estimation

In estimating the severity values and impact you can begin by measuring property and physical assets. The objective will be the attachment of values to those assets in order to determine the least and most costly in terms of replacement worth and service value. Only after estimating the worth of these items can you select a method to protect against their loss. Those properties worth the most in terms of monetary service importance should be protected aggressively by the best available methods such as safety insurance, pooling, preventive maintenance, etc. Those of lesser values or importance may not need such comprehensive protection and therefore may be a source of insurance cost savings.

Those risks identified as having high frequencies should receive priority attention in any risk management program. It makes little sense in risk management to devote a great deal of time and attention to guard against fire loss if a building is more prone to vandalism or flooding. Risks having devastating potentials are those best

protected through the commercial insurance market while some with lower impacts may be dealt with through several other methods described in the next phase.

## PHASE III— Method Selection

This phase outlines available methods to *reduce, eliminate, retain* or *transfer* those risks previously identified. Risks with greater frequencies of occurrence and those with severe impact potentials are the focus of this phase. For many governmental units the predominant method of risk protection is insurance. There are, however, dozens of available methods for risk protection other than the purchase of insurance. Some of these methods highlighted below can be employed to achieve the stated purposes.

### Risk Reduction

Many agencies have neglected long- or short-range risk reduction goals. Often the only goal was to purchase insurance in sufficient quantities to gain a feeling of complete risk protection. More and more agencies are now seeking to reduce the growing frequency and severity of risk exposures. Some of these agencies have already experienced lower costs while reducing their exposure to loss.

Nowhere are risk reduction efforts more important than in the workplace. Some of the reduction methods for risk exposures in the workplace might include safety inspections including review of occupational safety and health guidelines by trained inspectors, written memoranda to inform governmental officials and employees of what activities or decisions they can be held liable for according to statutory and case law, aggressive use of preventative

maintenance techniques on public vehicles and equipment, proper professional training of public safety personnel. The greatest hurdle may be in getting a genuine commitment to loss reduction from the policy board, management and the employees alike.

### Risk Elimination

The best way to reduce any anticipated or unanticipated loss is to avoid exposure to it entirely. Avoidance or elimination of a risk exposure implies knowledge about a situation *before* it occurs. Thus, eliminating risks means comprehensive pre-risk planning and review. By identifying and evaluating all risk exposures one begins to eliminate risks through forecasting "what's going to occur, when and where." It is not meant that government can provide services without incurring risks, but there may be individual decisions that should be influenced by considerations of the risk factor. Some ways suggested to eliminate or avoid risk exposures include: avoid providing a service if the total cost, including liability costs, exceeds the expense of contracting out the service; if an employee seems accident prone, transfer the individual to a less exposed job area; do not permit employees with poor driving records to operate vehicles or other equipment; immediately repair any unsafe road, trail or maintenance condition that may result in an accident; or do not leave equipment or vehicles in unprotected areas where theft or vandalism may occur.

### Risk Retention and Control

Risk management strategies often include retaining some losses intentionally. Retention is a form of "self-insurance" through the assumption by the insured of the limited level of

losses. A common form of retention is the *deductible provision* in insurance policies which require the policyholder to absorb a certain portion of the loss (\$50, \$100, \$1000, etc.). Retention of losses must be an active and conscious process. Unfortunately, it can become a passive or an unconscious action, meaning the loss is absorbed because the risk is not identified and, consequently, the government retains the loss due to default. A goal of any risk management program should be eradication of passive loss retention.

The retention of risks in a conscious way is a widely used form of risk management. Those types of risk exposures more attuned to retention are those with low impact costs. Some suggested methods for retaining risk include:

- make wise and optimum use of deductibles in commercial or pooled insurance contracts;
- non-insurance—don't insure losses which can be absorbed and will not have a severe financial impact if they occur;
- funding reserves—to fund losses an actual earmarked reserve is created and maintained through annual budgetary appropriations;
- drop items from insurance policies which no longer have value or items cheaper to replace than the cost of insuring them.

A thorough loss prevention and control program is needed to insure financial success under a risk retention program. The success or failure of retention programs depends in a large degree on the ability of the agency to control losses and to achieve fiscal stability. Without a stringent and effective loss control program the goal of retaining higher portions of the cost of risks will only be wishful thinking. Control efforts are often undertaken in conjunction with other devices. Many of the initiatives can only be achieved

with a progressive commitment from your governing body.

### Risk Transfer

Transfer involves the signing over of a risk to another party. The process of transferring risks should begin only after elimination, reduction or retention have been considered. Transfer is usually accomplished in writing through documents such as insurance contracts, service and purchasing contracts, intergovernmental agreements, lease agreements or other contracts. The principle for transferring risks is for financial protection from a possible loss. Transferring, however, should only be considered if financial capability cannot support a given amount of loss. Thus, risks with high impact or severe potentials are the prime candidates for transfer.

In addition to financial protection, transferring should provide other advantages. For instance, the auxiliary services typically provided in transfer arrangements are important. Insurance companies often have excellent engineering and safety services available as policyholders. The availability of this service and others should be provided for in the terms of the written contract.

A novel approach to transferring risks has been developed by a group of cities and villages in the Chicago area. This group has *pooled* funds customarily used to purchase insurance. Known as the Intergovernmental Risk Management Association (IRMA), it will be used by member governments to transfer individual risks to the resources of the group instead of commercial companies. Commercial insurance is then used to protect the members against devastatingly high losses. This approach can have substantial cost savings to the participants. Some suggested methods for

transferring risks include: leasing in lieu of purchasing property; insure the presence of "Hold-Harmless" and of the "Certificate-of-Insurance" clauses in written contracts, indicating a transfer of liability and proof of insurance; the use of surety bonds or performance guarantees to assure contractual obligations and conditions are met; purchase of insurance policies through companies with an assortment of risk coverages.

### Rules-of-Thumb for Method Selection

- Risk exposures whose loss impact has high severity potentials should be likely candidates for *transfer*.
- Risk exposures conducive to low severity losses may be *reduced* or *retained*.
- Liabilities may be *eliminated* by selling or disposing of unneeded property, or contracting for services, etc.
- *Avoid* and *control* risks whenever possible. If the risk or liability associated with an activity, program, or contract has a potentially extreme budgetary impact should a loss occur, work to avoid the risk or discontinue the program or activity altogether.

### PHASE IV—Administration of a Risk Management Program

Often the statement is made "we could be doing much more if we had additional time and resources." Those in government are now becoming acutely aware that limited resources threaten not only additional programs but the very substance of present services.

Fortunately, a risk management effort can thrive without added staff or tax dollars. It can save resources without the need for new expenditures. This will only be possible through an aggressive commitment from the governing body, management and employees to work together. It is a challenge in public service that must be faced with increasing fervor and dedication.

While all programs differ in scope and activity, the guidelines upon which to try to build your own local risk management program are shown below in a series of steps.

**Step 1.** Probably the single most vital part of the administration of a risk management program is the policy direction and practical commitment of the governing body. Without enterprising and purposeful direction a program can cease to be operational. Thus, your governing body must reduce to writing their pledge to the risk management effort.

The *policy statement* is essential to good administration and should contain information relating to local needs. The statement normally features the rationale and goals in risk management, and also the nuts and bolts of implementing these objectives. The statement should clearly identify the individual responsible for the effort, the "risk manager." Elements often included are: policy goals and philosophy, safety program directives, methods to be used, administrative and organizational authority, evaluation methods, contract review, retention limits, records and recordkeeping, insurance program administration.

**Step 2.** Insure that present risk protection efforts (if any) continue while the identification, evaluation and method phases are being completed.

**Step 3.** Begin to generate or gather the necessary records to actively administer the program. Key documents needed for comprehensive planning include: an insurance register, record of

losses, checklist of assets, resources and liabilities.

**Step 4.** Develop and disseminate internal operating procedures to guide internal control and reporting practices. Common practices are claims reporting, communications—formal and informal—contract review procedures, outside technical assistance, safety and loss control program guidelines, deadlines and timetables, funding considerations including levying needs.

**Step 5.** Initiate a loss control program by establishing safety and control efforts, possibly including the creation of a steering committee to involve line personnel and oversee the prevention effort.

### Conclusion

One controlling principle must remain prominent in any administrative attempt. Remember, risk management involves the protection of public and organizational interests against severe loss. Usually these losses are equated strictly with financial cost. A risk management program, whether it be purchasing insurance, self-insurance, safety or whatever, must first be designed to protect against human loss or injury. Secondly, the program should protect against operational public trust and financial losses, etc. Instituting a good risk management program can bear dividends for any governmental agency and should be carefully investigated and considered for implementation.

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# A Fire Safety Equivalency System for Overnight Accommodations

Harold E. Nelson

Last Spring, the National Park Service (NPS) asked the Center for Fire Research at the National Bureau of Standards (NBS) to expand the scope of its on-going work on fire safety equivalency measurement systems to include the types of hotels and dormitory accommodations found at major national parks. This is a report on the direction of, and progress made to date in that effort.

The aim of the equivalency system is to judge the fire safety of an accommodations facility, such as a hotel or staff dormitory relative to the level of fire safety prescribed by the National Fire Protection Association Life Safety Code (NFPA 101).

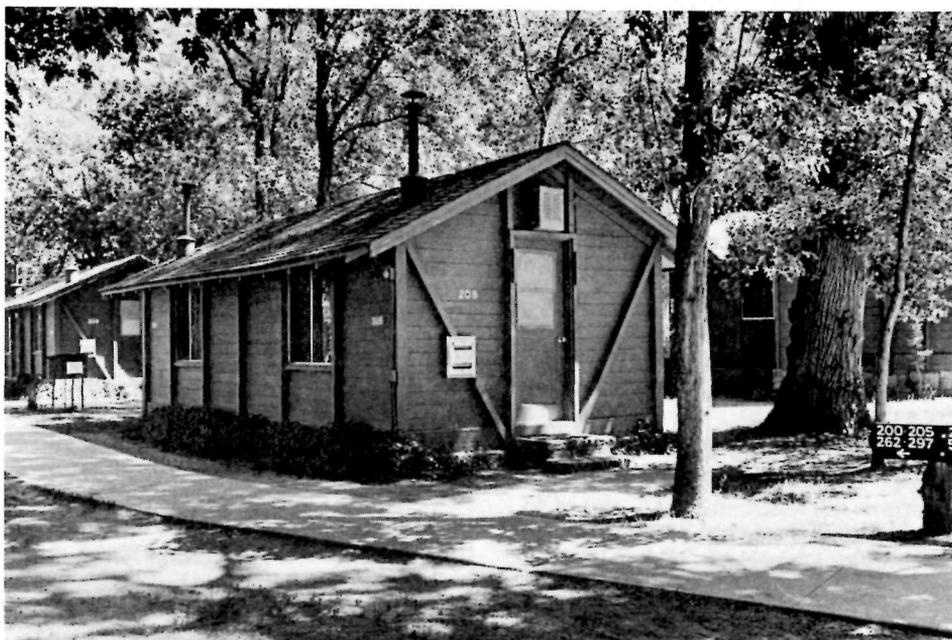
The equivalency system measures degree to which fire safety features that exceed the code compensate for those that fall below the code requirements, thereby producing an overall level of safety that is at least equivalent to that produced by exact conformance with each code requirement.

## The Problem

In the past several years both internal National Park Service service inspections and external audits reported that many NPS facilities had serious fire safety deficiencies. Often these inspections resulted in proposals for either massive expenditures or closing of the facilities. Often, the basis for judgment has been the Life Safety Code or another similar nationally recognized code. In many instances, it is functionally or economically unreasonable, if not impossible, to bring the existing NPS facility into strict conformance with the code.



Richard Frear



Richard Frear

The purpose of the Fire Safety Equivalency System is to judge the fire safety of an accommodations facility such as these cabins at Grand Canyon National Park (AZ) and Zion National Park (UT).

Building and fire safety codes are organized on the basis of class of occupancy, i.e., hotels, hospitals, etc. Normally they are suitable for the majority of the buildings in a certain class or occupancy. The criteria for hotels are generally based on the types of construction, fire department service, and utilities available in cities and other developed communities. Conversely, the NPS facility is by its nature remote, usually seasonal, tends to be of wood or other combustible construction with special emphasis on conforming with the surrounding environment, and frequently of some degree of historical importance.

Fire safety in the traditional metropolitan code-conforming building is based on fire resistance and compartmentation. The addition of any detection systems or sprinklers is considered to *enhance* but not replace the need for inherent structural fire resisting capability of the building. Conversely, NPS buildings tend to be primarily dependent on protection from detection and extinguishing systems. The NPS hotel building typically is combustible (often both wood framing and paneling), with little or no inherent fire resistance. The Center for Fire Research is striving to provide a flexible approach that will

bridge the differences and provide increased flexibility and economy in meeting fire safety needs. The instrument being used is entitled the Fire Safety Evaluation System for Overnight Accommodations (FSES-OA).

## The NBS Fire Safety Evaluation System

The FSES-OA is being developed as a performance-based equivalency methodology that:

- a. Evaluates the level of fire safety in any given facility as it compares to that prescribed by the Life Safety Code.
- b. Evaluates the fire safety performance of alternative designs or approaches that may be considered to upgrade buildings deficient in overall fire safety.
- c. Helps to identify new alternatives in forms suitable for cost comparison.

The National Bureau of Standards has had previous experience in developing this type of system. The most complete example is the Fire Safety Evaluation System for Health Care Facilities and its inclusion as an alternative approach for determining the fire safety of health care facilities in the 1981 Edition of the Life Safety Code.

The evaluation system approach is based on the equivalency option included in all of the major U.S. codes. The specific wording in the NFPA Life Safety Code is as follows:

"Nothing in this Code is intended to prevent the use of systems, methods, or devices of equivalent quality, strength, fire resistance, effectiveness, durability, and safety to those prescribed by this code, providing technical data is submitted to the authority having jurisdiction to demonstrate equivalency and the system, method, or device is approved for the intended purpose."

This statement is generally taken by the various code authorities to mean that alternative designs fully satisfy the regulations if the designs lead to a level of safety equivalent to that called for in the regulations. The FSES-OA will provide the approving authority with an objective definition of "equivalency."

## The Development of the FSES

From an analysis of the Life Safety Code, NBS engineers determined that there were eleven elements of design, construction, or equipment that are specified at varying levels for a hotel type of occupancy. Depending upon the size and height of the building, these add up to the statement of the overall safety required for that type of building. In addition, the analysis of the code indicated that the requirements could be conveniently broken down into three overlapping subdivisions based on the type of fire safety impact involved; one having to do with fire control, a second having to do with emergency egress, and the third having to do with refuge in the building. Any alternative building arrangement or design is considered to meet the intent of the code if it is possible to demonstrate that the alternative approach provides the same level of fire safety in the individual impact areas. The FSES measures this sameness.

While development of the FSES for overnight accommodations is not yet completed, it is now ready for test and demonstration. Its development to date has been closely linked with the development of a similar system for board and care facilities also being undertaken by NBS. The reader is cautioned that while the version of the FSES presented in this article is complete in form and can be executed, it is still under test and will likely change before it is suitable for field use. At its current state, anyone attempting to exercise the system should recognize this limitation.

The derivation of this evaluation system closely parallels that previously done for health care facilities (see "Fire Safety," p. 48). The initial step was to evaluate in detail the eleven basic elements of design construction and equipment, and to divide these elements into levels corresponding to the levels prescribed in the code or found in the field. Each of these levels was then assigned a relative contribution to the overall risk or safety (as appropriate) of the facility. In general, negative numbers represent an item detrimental to life safety and positive numbers represent items supportive to life safety. The initial assignment of numbers was done by a delphi exercise using fire protection engineers at NBS. Following this initial exercise, groups of consultants were assembled consisting of designers, enforcing authorities, and other experts in the field to review and make changes to the initial evaluation. As of this date, extensive initial field tests have been conducted on boarding-home type facilities. The transfer of the system to National Park Service facilities, however, has involved some adjustments in definition and footnotes that have important impacts on the evaluation. Both the difference between NPS facilities and those being examined in current field tests, and the changes in definitions necessitate specific testing against NPS types of facilities.

## How the System Works

The Fire Safety Evaluation System uses a five part form. The version of the FSES presented in this article is for larger hotel type facilities. A second version has been developed for the small dormitories or boarding houses.

The definitions used in the form are coordinated with the definitions of the Life Safety Code. A glossary also accompanies the FSES to cross-reference from the form to the Life Safety Code and to cover those areas of definition that are not included in the code.

**Figure 1**

**HAZARDOUS AREAS**

	<b>NO PROTECTION</b>	<b>SPRINKLER PROTECTION</b>	<b>FIRE RESISTIVE ENCLOSURE</b>	<b>SPRINKLERED &amp; FIRE RESISTIVE ENCLOSURE</b>
<b>NOT STRUCTURALLY ENDANGERING</b>	<b>SINGLE DEFICIENCY</b>	<b>NO DEFICIENCIES</b>		
<b>STRUCTURALLY ENDANGERING</b>	<b>DOUBLE DEFICIENCY</b>	<b>NO DEFICIENCY</b>	<b>NO DEFICIENCIES</b>	<b>NO DEFICIENCIES</b>

**Completing Part A (Table 1)**

Part A consists of Table 1, Safety Parameter Values. For each of the eleven safety parameters in Table 1, simply select and circle the level of safety *variable* for each parameter that best describes the conditions in the facility. Only one level is chosen for each of the eleven parameters. If two or more appear to apply, then the one with the lower value is used. Almost all of the parameter and level headings should be familiar to those who have used the Life Safety Code. A few, such as the evaluation of charges for hazardous areas, require some special definitions. Figure 1 is abstracted from the FSES-OA Glossary and depicts the essence of the approach used to classify hazardous areas. The definition of a hazardous area is any space or compartment that contains a storage or other activity that is not part of the normal accommodation arrangement and possesses the potential of producing a serious fire. These would normally include storerooms, shops, larger retail operations, etc. When Table 1 is completed, there should be only one block, i.e., *level* circled in each of the eleven safety parameters. Where the circled *level* includes a footnote reference, that reference should be read and the appropriate value based on the footnote.

**Completing Part B (Table 2)**

Table 2, Individual Safety Evaluation is completed by transferring each of the eleven selected parameter values on Table 1 to every unshaded block in the corresponding line in Table 2. Where the block in Table 2 is indicated with " $\pm 2$ ," enter only  $\frac{1}{2}$  the value shown in Table 1. It is important that a number appear in each of the unshaded blocks in each of the four columns.

The four columns are then added, keeping in mind that any negative numbers are to be subtracted. The results are logged in the total line at the

bottom, giving values for  $S_1$ ,  $S_2$ ,  $S_3$ , and  $S_4$ .

**Part C, Determining Mandatory Safety Requirements (Table 3)**

Table 3 is a list of several levels of mandatory safety requirements. At this time, the exact level to be used for NPS facilities is still under discussion and the three levels shown are those currently proposed by NBS for NPS consideration. These levels were derived by measuring the requirement of the Life Safety Code with the FSES—OA. Safety Level 1 is equivalent to that prescribed by the 1981 Life Safety Code for existing hotels. Safety Level 3 is that prescribed by the Life Safety Code for new hotels. Safety Level 2 is an intermediate level suggested by the NPS for consideration by the author. It is the expectations of the NBS that the ultimate choice will be made by the National Park Service with NBS support. From this Table, mandatory safety requirements for the appropriate safety level and building height are determined. Each level has a profile of four separate values; one for control ( $S_a$ ), one for egress ( $S_b$ ), one for refuge ( $S_c$ ), and one for general fire safety ( $S_d$ ).

**Part D, Determining Fire Safety Equivalency (Table 4)**

The fire safety equivalency of the basic architectural features is determined by Part D. This is done by completing Table 4. Table 4 is arranged to receive entries from Tables 2 and 3. From Table 2, enter the values for  $S_1$ ,  $S_2$ ,  $S_3$ , and  $S_4$ . From Table 3, enter the values  $S_a$ ,  $S_b$ ,  $S_c$ , and  $S_d$ . Perform the indicated subtractions. This will produce values in the blocks labeled C, D, R and G. For each row check "yes" if the answer in the block is "0" or greater. Check "no" if the value in the answer block is a negative number.

**Part E, Determining Equivalency Conclusions (Figure 2)**

The conclusions are derived by checking either line 1 or 2 in Part E in answer to the question of whether there are any negative values shown in Table 4. Part E also requires the answering of five questions covering important fire safety considerations not covered under the relative value equivalency portion of the evaluation system. At this stage of development, there are no evaluation systems covering these items and they must be judged in the traditional manner.

**Limitations on the System**

The system presented here is limited to hotel, motel or dormitory type facilities. It has not been proofed for high rise facilities such as those that exceed 6 stories in height. Risk evaluation is also based on the normal type of furnishings expected in NPS types of hotels. This visualizes the normal mix of furnishings and types of activities that would be found but does not consider any wide variations that would cause major increases in fire risk. The system is purely based on the current code definitions of the variables in Table 1. The assigned numbers are not flexible and deviation from either the explicit code or an exact equivalent performance to that prescribed for that element is not admissible in this system. Future work is planned to provide separate methods for evaluating partial performance conditions but at present the elements must be assigned only the value that they fully meet.

PART A

Table 1. SAFETY PARAMETER VALUES

SAFETY PARAMETER	PARAMETER VALUES								
	COMBUSTIBLE				NONCOMBUSTIBLE				
1. CONSTRUCTION BUILDING HEIGHT	TYPE V (000)	TYPE V (111)P	TYPE III (200)	TYPE III (211)P	TYPE IV (2HH)	TYPE II (000)	TYPE II (111)P	TYPE I & II (222)	
	1 STORY	-2( )A	0	-2( )A	0	0	-2( )A	2	2
	2 STORY	-6( )A	0	-6( )A	0	0	-5( )A	2	2
	3-6 STORY	-8( )A	-2	-8( )A	0	-2	-6( )A	2	2
2. HAZARDOUS AREAS	WITHIN BDRMS SUITES OR ON EXIT ROUTES				ELSEWHERE IN BUILDING			NONE, OR NO DEFICIENCY	
	DOUBLE DEFICIENCY		SINGLE DEFICIENCY		DOUBLE DEFICIENCY		SINGLE DEFICIENCY		
	-7		-4		-4(-7)B		0(-4)B	0	
3. MANUAL FIRE ALARM	NO ALARM	MANUAL ALARM							
		w/o F.D. NOTIF.	w/ F.D. NOTIF.						
	0(1)L.M	2	3						
4. SMOKE DETECTION & ALARM	NONE OR INCOMPLETE J.L.M	SINGLE STATION UNITS IN EACH BEDROOM L.M	INTERCONNECTED SYSTEM ( I )			TOTAL BUILDING			
			w/o BDRM/SUITE DETECTORS	SINGLE STATION BDRM/SUITE DETECTORS	INTERCONNECTED BDRM/SUITE DETECTORS				
-4(0)	0(2)	2(0)E	3(0)E	5	6				
5. AUTOMATIC SPRINKLERS	NONE	BDRMS/SUITES ONLY	CORRS. COMMON SPACES	BDRMS/SUITES, CORRS. COMMON SPACES	TOTAL BUILDING				
					STANDARD	SPECIAL			
0	2(0)C	4(0)C	6	8	10				
6. SEPARATION OF BEDROOMS SUITES	NONE OR INCOMPLETE	WALLS OR DOORS < 20 MIN.(F)		BOTH WALLS AND DOORS ≥ 20 MIN.(G)		≥ 1 HR. WALLS (N) ≥ 20 MIN. DOORS (G)			
		w/o LOCK. AC	w/ LOCK. AC	w/o AC	w/ AC	w/o AC	w/ AC		
		-6	-1	0	1( 0 )B	2( 0 )B	3( 0 )B	4( 0 )B	
7. EXIT SYSTEM	SINGLE OR EXPOSED ROUTE	MULTIPLE ROUTES							
		DEFICIENT	w/o HORIZ.	HORIZ. EXIT	SMOKE PROOF STAIRS	DIRECT EXIT			
	-6	-2	0	2	2	4			
8. EXIT ACCESS	MAX. DEAD END		NO DEAD END 35' & TRAVEL IS:						
	>100'	>35' ≤ 100'	>150'	100'-150'	50'-100'	<50'			
	-6(0)D	-4(0)D	-2	-1	0	2			
9. INTERIOR FINISH	FLAME SPREAD RATINGS								
	EXIT ROUTES		>25 ≤ 75		≤ 25				
	>75 ≤ 200		>25 ≤ 200		>25 ≤ 200				
	>25 ≤ 200	≤ 25	>25 ≤ 200	≤ 25	>25 ≤ 200	≤ 25			
ROOMS/SUITES	-3(0)M	-1(0)M	-1(0)M	0	1	2			
10. VERTICAL OPENINGS	OPEN (OR INCOMPLETE ENCLOSURE)			ENCLOSED H					
	THRU 5 OR MORE FLOORS		3-4 FLRS.	2 FLRS.	< 1 HR.	≥ 1 HR.			
	-10		-7	-2	0	1(0)BK			
11. SMOKE CONTROL	NONE	SMOKE PARTITIONS	MECHANICALLY ASSISTED SYSTEMS						
			BY FLOOR		BY ZONE	BY RM./SUITE			
	w/o PART.	w/ PART.							
	0	2	2	3	3	4			

- NOTES:
- A- Use (-1 x height in stories) if building is sheathed with plaster, gypsum board or similar materials.
  - B- Use ( ) in multi-story buildings if Item 1 is based on Type V (000), Type III (200) or Type II (000) without Note "A" and Item 5 is ≤ 4.
  - C- Use ( ) if Item 1 is based on Type V (000), Type III (200) and Type II (000).
  - D- Use ( ) if Item 7 is -6.
  - E- Use ( ) if Item 6 is based on "None or Incomplete", or "Walls or Doors" are < 20 min. and Item 5 is ≤ 4.
  - F- Use < 20 min. in all cases of complete separation if building supports and floors are < 20 min. and Item 5 is ≤ 4.
  - G- Use ≥ 20 min. in all cases of complete separation if Item 5 is > 8. Use 1 hr. only if separation is ≥ 1 hr. and Item 1 is not Type V (000), Type III (200) or Type II (000).
  - H- Use 0 in 1 story buildings that have no vertical openings.
  - I- Interconnected systems covering corridors and common spaces plus indicated bedroom or suite detectors.
  - J- Use (0) where less than 15 guests are accommodated and Item 1 is not based on V(000); M(200) or I(000)
  - K- 20 min. in existing bldgs.
  - L- Use ( ) where Item 7 is 4 in buildings not over 3 stories.
  - M- Use ( ) where item 5 is ≥ 6.
  - N- ½ hr. for sound existing walls or if item 5 is 6 or 8, smoke resistant if item 5 is 10.
  - P- Use this column for indicated type regardless of sheathing if item 5 is 10.

**PART B**

**Table 2. INDIVIDUAL SAFETY EVALUATIONS**

SAFETY PARAMETER	FIRE CONTROL (S1)	EGRESS PROVIDED (S2)	REFUGE PROVIDED (S3)	GENERAL FIRE SAFETY PROVIDED (S4)
1. CONSTRUCTION				
2. HAZARDOUS AREAS		±2		
3. MANUAL FIRE ALARM	±2			
4. SMOKE DETECTION & ALARM	±2		±2	
5. AUTOMATIC SPRINKLERS		±2	(±2)A	
6. SEPARATION OF LIVING UNITS		±2		
7. EXIT SYSTEM			±2	
8. EXIT ACCESS				
9. INTERIOR FINISH	±2			
10. VERTICAL OPENINGS	±2			
11. SMOKE CONTROL				
<b>TOTAL</b>	<b>S1=</b>	<b>S2=</b>	<b>S3=</b>	<b>S4=</b>
NOTE: A - Use full value if Safety Parameter 1 is based on Type V (000), Type III (200) or Type II (000) construction. Divide by 2 (±2) in all other cases.				

**PART C**

**Table 3. MANDATORY SAFETY REQUIREMENTS**

SAFETY LEVEL "S"	CONTROL REQUIREMENT (Sa)	EGRESS REQUIREMENT (Sb)	REFUGE REQUIREMENT (Sc)	GENERAL FIRE SAFETY REQUIREMENT (Sd)
<b>S = 1</b>				
1 STORY	0	0	2	0
2-6 STORY	1	0	3	1
<b>S = 2</b>				
1 STORY	3	6	2	6
2-6 STORY	4	6	3	7
<b>S = 3</b>				
1 STORY	6	7	5	9
2-6 STORY	6	7	5	9

**PART D**

**Table 4. FIRE SAFETY EQUIVALENCY EVALUATION**

						YES	NO	
CONTROL PROVIDED (S1)	less	REQUIRED CONTROL (Sa)	≥ 0	S1	Sa	C		
				<input type="checkbox"/>	-	<input type="checkbox"/>	=	<input type="checkbox"/>
EGRESS PROVIDED (S2)	less	REQUIRED EGRESS (Sb)	≥ 0	S2	Sb	D		
				<input type="checkbox"/>	-	<input type="checkbox"/>	=	<input type="checkbox"/>
REFUGE PROVIDED (S3)	less	REQUIRED REFUGE (Sc)	≥ 0	S3	Sc	R		
				<input type="checkbox"/>	-	<input type="checkbox"/>	=	<input type="checkbox"/>
GENERAL FIRE SAFETY (S4)	less	REQUIRED GEN. FIRE SAFETY (Sd)	≥ 0	S4	Sd	G		
				<input type="checkbox"/>	-	<input type="checkbox"/>	=	<input type="checkbox"/>

**Complete Tables 1-4 before doing this part**

1. [ ] All of the checks in Table 4 are in the "yes" column. The level of fire safety is at least equivalent to that prescribed for large residential facilities.\*
2. [ ] One or more of the checks in Table 4 are in the "no" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by the Life Safety Code for large residential facilities.

\*The equivalency covered by this worksheet includes the majority of considerations covered by the Life Safety Code. There are a few considerations that are not evaluated by this method. These must be separately considered. These additional considerations are covered below.

**Status and Future**

The evaluation system being described herein is currently being presented to the National Park Service with the NBS recommendations for field test and proofing. Upon completion of this test and other certifying efforts by NBS, a final report and recommendation for field use will be made. In the meantime the author would appreciate any comments from the reader.

*Harold E. Nelson is Head, Design Concepts Research at the National Bureau of Standard's Center for Fire Research.*

**Facility Fire Safety Requirements Worksheet**

CONSIDERATIONS	MET	NOT MET	NOT APPLIC.
<b>A. BUILDING UTILITIES CONFORM TO THE REQUIREMENTS OF PARAGRAPH 7-1 OF THE LIFE SAFETY CODE</b>			
<b>B. THE AIR CONDITIONING, HEATING, AND VENTILATING SYSTEMS CONFORM WITH PARAGRAPH 7-2 OF THE LIFE SAFETY CODE.</b>			
<b>C. ELEVATOR INSTALLATIONS ARE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF PARAGRAPH 7-4 OF THE LIFE SAFETY CODE.</b>			
<b>D. FLUE FED INCINERATORS ARE INSTALLED IN ACCORDANCE WITH PARAGRAPH 7-5 OF THE LIFE SAFETY CODE.</b>			
<b>E. AN EMERGENCY ORGANIZATION MEETING THE REQUIREMENTS OF SECTION 31-6 OF THE LIFE SAFETY CODE EXISTS AND IS FUNCTIONAL.</b>			

**PART E - DETERMINING EQUIVALENCY CONCLUSIONS (Figure 2).**

## Some Reflections on Contracting

By James Wolfe

The majority of National Park Service areas have been maintained with comprehensive support facilities such as complete carpentry, plumbing, electrical shops, vehicle repair shops, and audiovisual and curatorial shops. Fire suppression and search and rescue capabilities were provided, along with increased support staff of fiscal, property, procurement and administration people. More than ever before, people were commuting from neighborhood communities to work in the parks. Parking lots, sidewalks, night lighting and even snow plowing were and are furnished for this rather sizable park support population.

It is the need for goods and services of the support population for fair and adequate working conditions, the actual labor costs of the support population, and the physical plants from which the support population functions that consume a great share of a park's budget. The park support population and associated physical plants require water and sewer, light, heat, cooling, telephone and clerical service, job safety training, hard hats and safety shoes, xerox machinery, transportation, and on and on. It is here, in the support functions housed and operating in the parks, that savings in costs can be made.

### Myths

**Myth:** "It is impossible to contract services to haul away our garbage because my funds are tied up in personal services performing the work. There is no money to contract for services without laying people off."

**Reality:** The cost of personal services for a singular function such as garbage collection is the smallest cost of the entire function. The support cost which includes the operation and maintenance of the facilities and their associated employees necessary for garbage disposal are the real expense. More details follow, but for now con-



*A mentally-handicapped student of the Melwood Horticultural Training Center maintains grounds, under contract, at Constitution Gardens, in Washington (DC).*

James Wolfe

sider the shop space for garbage truck service, repair, spare parts, utilities for the shop, procurement actions for spare parts, driver and mechanic education and training, etc. These are the real costs. The sanitation service employee is but a fraction of the dollars required for garbage removal.

**Myth:** "We can save money only if we close up the park or parts of the park on Mondays and Tuesdays, close up early, reduce services, limit visitation . . ."

**Reality:** Closed facilities are expensive to maintain and operate. The comfort station requiring the most repair is the comfort station that is closed. The signs that require replacement and repair are those signs in the area of the park that is closed. Close your entrance station and you lose the entrance sign. Ellis Island (NY) is a

classic example of accelerated decay of unused buildings. Over one-million square feet of usable space in a prime location declined to massive decay for largely no reason other than its disuse.

**Myth:** "The Environmental Protection Agency regulations for water and sewer services, the Occupational Health and Safety Administration (OSHA) standards for employee occupational health and environmental standards imposed upon us are massively expensive; the cultural mandates are utterly impossible to achieve without massive transfusions of money."

**Reality:** The costs do not lie to any significant degree in the achievement of these programs. Instead, the actual cost that is strangling you is operation and maintenance costs of the support facilities constructed to manage the functions.

## Contracting Maintenance Operations

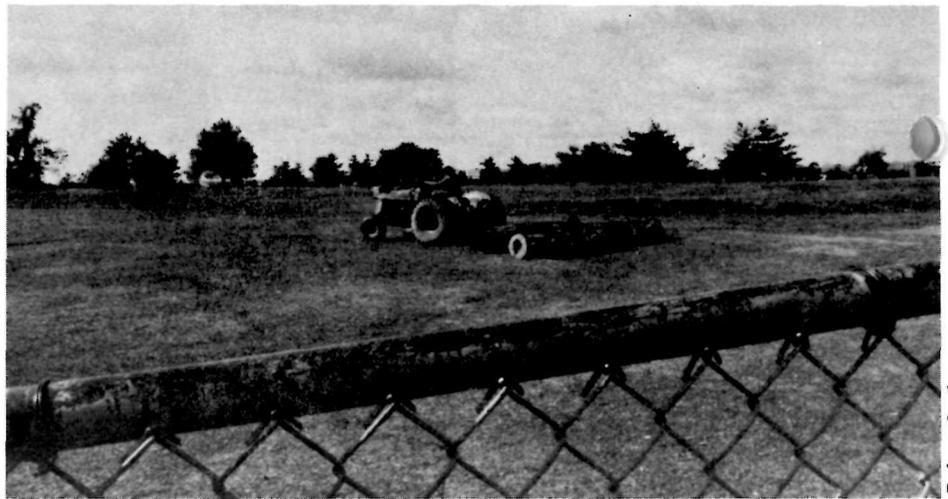
Please consider one of two types of contracting services that are available. One type is contracting with contractors, and the other general type is contracting without contractors. Let's talk about each and show specific examples.

### Contracting with Contractors

Let's discuss the motor vehicle maintenance shop. However, the audiovisual repair shop, the plumbing shop, the park ranger-Park Police detention, the holding and booking facility could easily have been used. The shop rate for most vehicle repair facilities approaches \$31 per hour regardless if the facility is in a remote or an urban area. Location means very little in the true cost picture.

The vehicle shop is a complex of several structures. It includes a paved parking area with lights, fuel and lubrication storage and dispensary; spare parts storage, dispensing and employees' amenities, complete with office. The facility operates 8 hours a day, 5 days a week, for employees whose net work time is sometimes little more than 6 hours a day. The preponderance of the time spent away from the job occurs from sick leave, training and orientation, safety meetings, the attendance to OSHA requirements, employee evaluation, special park meetings, community campaigns, and a host of other events.

The building that houses the vehicle facilities is heated and secured 24 hours a day. The building expenses are water and sewer utilities, electric power, gas or fuel oil heat, telephone, janitorial service, waste generations and cyclic repair/rehabilitation to mention just a few.



*East Potomac Park Golf Course is mowed by contractor.*

Robert Cook

All these factors contribute to the enormous support costs needed to keep vehicles running. We have not mentioned personnel, finance, training, safety, health services and procurement divisions that contribute directly and indirectly to the function for each shop employee.

Once again, it is not economical to heat, light, ventilate, cool, provide telephone, water and janitorial services, and remove the wastes from a support building that is often only productively used only 6 hours a day. My suggestion is to convert all possible shops to storage areas (or equivalent) and competitively award contracts for services. Bear in mind that contractors must be selected competitively by a known performance record, and they are paid only when they perform.

### Equipment vs Rental Equipment

An employee in the National Park Service's National Capital Region's Maintenance Office prepared a detailed analysis to reaffirm the actual costs of owning heavy equipment or vehicles. After working a life cycle cost comparison, it became evident that vehicle ownership was more expensive and actually less productive than rental or contract arrangements.

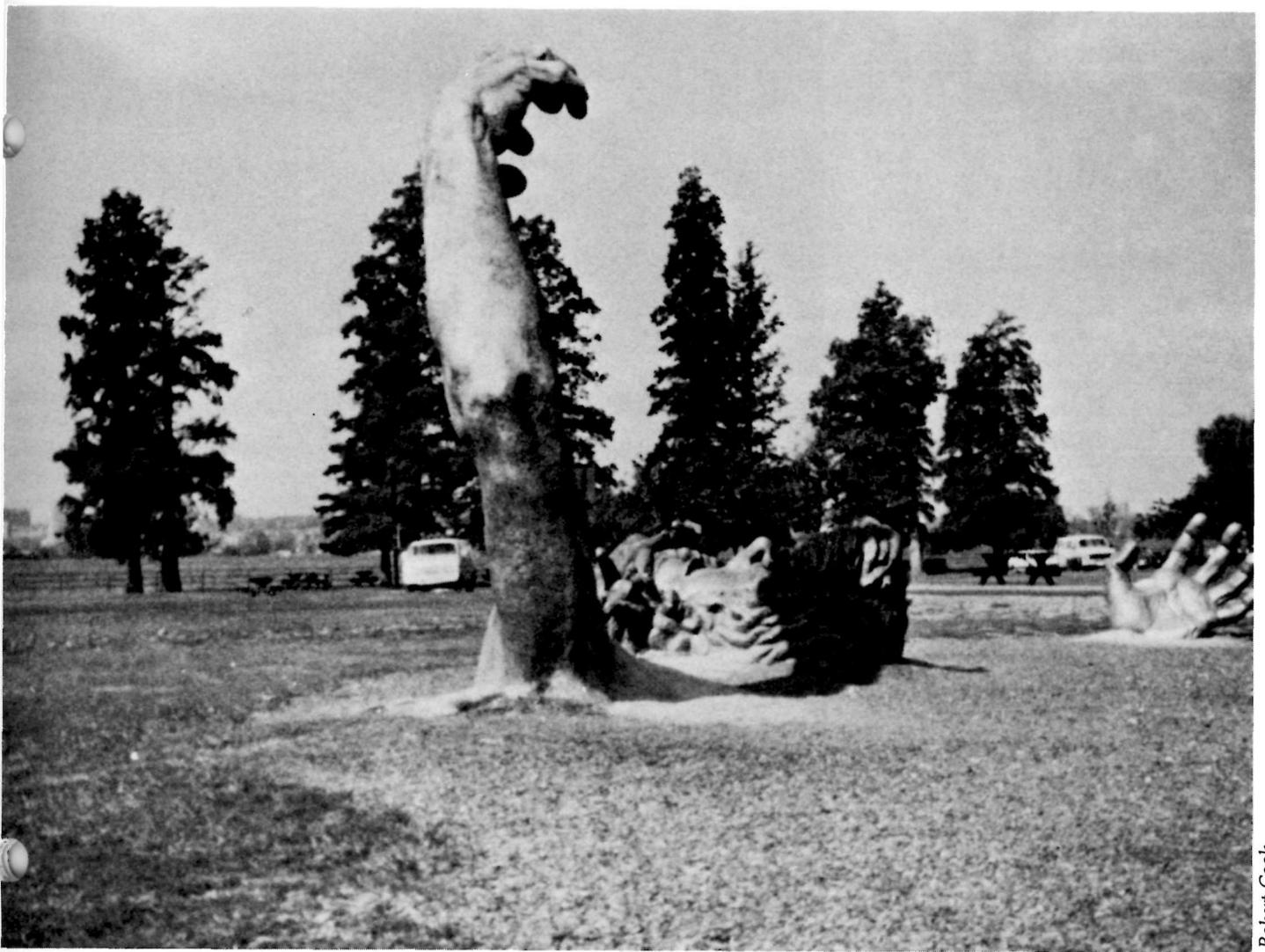
### Contracting without Contractors

This idea is relatively new to the National Park Service but it is old hat with city, county and state park areas. It is called the Adopt-a-Park program and consists of using volunteers for

maintenance work without being formally called volunteers in the parks. By means of a cooperative agreement, each party stipulates its commitment and services to be performed, and calls out that the group provides its own insurance coverage for group members, thus relieving the federal government of responsibility for any injury, accident, loss or damage that may result from the exercise of the responsibilities referred to in the agreement.

The public has very special interests and very special resources. The special interest can lie in trails and related hiking enjoyment, it can be in a favorite campground, or it can be in the wonderful solitude characterized by a unique area. Whatever the special interest, groups hunger for an opportunity to perpetuate their special interest. They want a base of action. They want a stake in the game. It is their park, and this need can be satisfied to the advantage of both the park and the park user. By carefully wording an agreement between both parties, it can be executed for services at about 1/10 the cost of conventional maintenance.

The other avenue in contracting without contractors is the acceptance of gifts by donors who seek to participate in resources management with the only tool available to them—money—and enjoy consideration on personal income taxes. There is a process to accept funds through an existing foundation, wherein funds are accepted and used for general or special purposes managed by the park.



Robert Cook

Some structures require very little maintenance such as "The Awakening" in Washington, DC.

## Labor Costs

The minimum wage allowed to be paid in the Washington, DC area is \$5.20 per hour for federal government maintenance employees. This rate varies depending on geographical location throughout the nation. However, any variance in the government rate is determined by any variance in the private sector rate. Therefore, the numbers are comparable. In the Washington, DC area, the industry rate for mowing operations is approximately \$4.00 per hour.

The benefits to be added to the basic hourly rate for federal employees are 38% which include annual leave, sick leave, retirement, employee contributions, etc. (see OMB data below.) The benefits for the private sector laborer are limited to unemployment compensation and

social security, usually 15%. Consequently, the comparison of the two begins with \$7.18 per hour for a federal employee vs. \$4.60 per hour for a private sector employee.

One other important cost element in this comparison would be overhead. This includes all the support cost essential to keeping an employee on the job such as training, personnel, payroll, supervision, awards, discipline, etc., which is conservatively estimated for government employees at 100 percent. The overhead, profit, bonds, and insurance normally attributable to industry labor is 45%. Now you can begin a true cost comparison. You may want to utilize the Cost Comparison Handbook, published by the Office of Management and Budget in March 1979, (also referred to as Supplement No. 1 to OMB Circular A-76).

Each park has different conditions, different work seasons, and different requirements. Consequently, comparing one cost for one function in area A could not easily equate to similar comparisons in area B.

We in the National Capital Region have been successful in contracting for maintenance operations. You can be too!

*James Wolfe is Chief, Division of Maintenance for the National Park Service's National Capital Region in Washington, DC.*

# Hazardous Waste Management

by Frank J. Ruswick, Jr.

At first blush, the concepts of recreation area management and hazardous waste management appear unrelated, if not mutually exclusive. Yet a closer examination will reveal that a park manager, concerned as he or she must be with aspects of solid waste management generally, must also be aware of the special legal requirements applicable to the management of those wastes considered hazardous. Note, for example, that park areas generate, or at least might be responsible for, the proper disposal of herbicide and pesticide containers, recreational vehicle holding tank wastes, and maintenance materials such as creosote. In certain circumstances all of these wastes could be considered hazardous.

## Legal Requirements

The primary legal restrictions pertaining to the handling and disposal of hazardous waste are imposed by the Resource Conservation and Recovery Act (RCRA), which amended the Solid Waste Disposal Act, and the implementing Environmental Protection Agency (EPA) regulations. In addition, requirements may be imposed pursuant to a state hazardous waste management program which has been approved by EPA. In either case, legal requirements apply "cradle to grave," covering the generation, storage, transportation and disposal of hazardous waste.

With minor exceptions (e.g., "household" type wastes), any "solid waste" including liquid and contained gaseous material, which is intentionally or unintentionally discarded is potentially subject to hazardous waste regulation. For all discarded material a determination must be made as to whether the material is in fact hazardous under EPA regulations. EPA excludes some wastes as non-hazardous (e.g., discharges covered by a National



Midnight dumpers illegally getting rid of hazardous wastes.

Jane Russo, EPA

Pollution Discharge Elimination System Permit), and identifies others as "hazardous" (such as chlordane) or "acutely hazardous" (rodenticides such as D-Con and Rat-B-Gon).

Any other discarded material is hazardous if it exceeds limits set by EPA in any one of four categories of characteristics: ignitability, corrosivity, reactivity and E.P. toxicity. The determination of whether these limits are exceeded is made either by testing, according to EPA guidelines, or by applying knowledge of the nature of the waste.

## Hazardous Waste Determination

For most recreation area refuse, it is safe to say the latter test—common sense—will be sufficient to determine whether a given waste is hazardous. Although testing may be expensive, testing particular types of wastes may be prudent. For example, recreational vehicle holding tanks often require chemical additives to facilitate decomposition and reduce odor prior to pumping. For those recreation areas that provide pumping facilities, the accumulated waste could be considered hazardous either if it contains chemicals which are designated hazardous by EPA (the mixture of hazardous and non-hazardous waste is termed "process waste"), or if it exceeds hazardous waste standards of one of the four characteristics. In either case, testing may be necessary

to determine if the waste is hazardous for purposes of RCRA management requirements.

Two other aspects of hazardous waste management important to recreation areas can be illustrated by reference to pesticides. RCRA and its implementing regulations apply only to discarded material. Thus, use of a pesticide, spraying a wetland to reduce mosquito populations for example, is not regulated by RCRA (although other laws may apply) even though the pesticide is listed as hazardous by EPA.

Secondly, a container which formerly held a hazardous material is also hazardous waste when discarded unless "empty" as defined by EPA. Therefore, recreation areas should take care to meet the regulatory definition of "empty" when discarding, for example, a container which formerly held chlordane or another hazardous material under EPA regulations.

## Amounts of Hazardous Waste

Once a recreation area manager has identified a given waste as hazardous, its subsequent handling, including storage, treatment, transportation and disposal, is limited by RCRA requirements. The extent to which limitations apply, however, is dependent upon the amount of hazardous waste generated and/or stored by the recreation area.

EPA regulations define two classes of persons whose activities produce hazardous waste: generators and small quantity generators. Full RCRA regulations apply only to the former, whereas the latter need only meet the requirement that disposal be in a facility which has an EPA or state permit to accept hazardous waste.

Small quantity generators are those who produce less than specified limits of hazardous material each month or accumulate less than these limits, irrespective of time, prior to disposal. These limits are 1000 kg. of hazardous waste, 1 kg. of acutely hazardous waste and 100 kg. of contaminated soil, water or other debris resulting from the clean-up of an acutely hazardous waste spill.

It is likely that those recreation areas that do produce hazardous waste will qualify as small quantity generators. These areas should be aware that if the generation limit is exceeded in any month, the area loses its small quantity generator status for that month but not necessarily subsequent months. In addition, the storage limits apply independent of one another. For example, an area storing 1200 kg. of hazardous waste and .5 kg. of acutely hazardous waste is a "small quantity generator" of the latter, but a "generator" of the former.

As stated earlier, the distinction between generators and small quantity generators is important for the extent of regulatory requirements that apply to hazardous waste management practices. In effect, small quantity generator status provides a reprieve from the extensive management practices required of producers of hazardous waste generally. These management practices are imposed mainly to facilitate the "cradle to grave" regulatory scheme of RCRA, but also include requirements designed to reduce the dangers of hazardous wastes while in the generator's possession.

## Hazardous Waste Tracking

To facilitate tracking of hazardous waste, a generator must apply to EPA for an identification number, prepare a manifest prior to shipment, meet pre-transportation requirements (including those pertaining to packaging, labeling, marking and placarding), meet certain record-keeping and reporting requirements and, like the small quantity generator, dispose of the wastes in a facility permitted to receive hazardous wastes.

## Hazardous Waste Storage

The requirements designed to prevent damage from hazardous wastes while in the generator's possession apply predominantly to storage of the wastes. A generator may store hazardous waste "on-site" for a period of ninety days by meeting requirements relating to form and method of storage. If the ninety-day limit is exceeded or if the wastes are not stored "on-site," the generator must meet extensive requirements applicable to hazardous waste storage facilities. If a recreation area produces hazardous waste at scattered locations, but accumulates the waste in a central location prior to disposal, EPA's definition of "on-site" should be reviewed to determine if the central location is governed by regulations applicable to storage facilities.

## Transporting Hazardous Waste

The transportation of hazardous waste is also regulated according to whether the waste was produced by a generator or a small quantity generator. If the waste is produced by a generator, the transporter is required to obtain an EPA identification number, assure that packaging and labeling requirements are met, and fulfill record-keeping and reporting requirements. If the waste is produced

by a small quantity generator, none of these requirements apply. It is more likely, therefore, that a recreation area will be capable of transporting its own hazardous waste to a disposal facility if the area possesses small quantity generator status.

RCRA regulations also govern the treatment, storage and disposal of hazardous waste. These activities are both broadly defined and highly regulated. For the most part, however, these activities are unlikely to occur in recreation areas. The types of treatment and storage activities that might occur in recreation areas are generally exempted from extensive regulation. For example, hazardous waste produced by a small quantity generator recreation area may be treated to facilitate storage, transportation or disposal without the areas qualifying as a "treatment facility." Likewise, a recreation area can take actions to immediately contain or treat a hazardous waste spill without meeting treatment facility regulations. Finally, as discussed above, a generator may store hazardous waste for a period of ninety days, and a small quantity generator may store wastes as long as the eligibility limits are not exceeded, without being considered a "storage facility."

## Additional Regulations

Although RCRA, including its implementing regulations, provides an extensive regulatory web, it does not cover the entire field of hazardous waste management. Other laws and regulations apply to aspects of hazardous waste management not governed by RCRA as well as the management of wastes which, although hazardous, are primarily regulated under statutes other than RCRA.

The Comprehensive Environmental Response Compensation and Liability Act, commonly called "Superfund," provides a statutory framework for

*An environmental official demonstrates the hazardous wastes lying beneath benign-looking field.*

the cleanup of abandoned hazardous waste disposal facilities (either previously operating facilities or "midnight dumps") and hazardous waste spills. These dangerous occurrences might be of concern to some recreation areas, especially large, remote parks or those adjoining navigable waterways.

Under Superfund and a recent Executive Order assigning responsibilities for its implementation, EPA has primary authority for coordinating the activities envisioned by the Act. The first is prioritizing and arranging cleanup of abandoned sites. The second is developing the National Contingency Plan and coordinating the National Response Team for meeting the exigencies of hazardous material spills.

In the event that a recreation area contains an abandoned hazardous waste dump, the area manager should notify EPA of its existence. If the responsible party cannot be found, EPA will prioritize the site as a possible recipient of Superfund monies to clean up the site.

If a hazardous material spill occurs on recreation area lands, the area manager should take only such immediate actions as will secure the area. This involves sealing the area from visitors and might include limited activities to reduce danger to health or the environment. For example, a leaking drum of liquid wastes could be positioned so as to reduce or eliminate the leak. EPA should be notified of the spill as quickly as possible.

In addition to the requirements of RCRA and Superfund, special statutes and regulations may apply to the management of specific types of materials such as polychlorinated biphenyls (PCBs). PCBs are listed as a "hazardous constituent" under RCRA regulations. As a result, wastes which contain PCBs are subject to RCRA regulation. However, PCB's are also



*Environmental Protection Agency*

regulated by the Toxic Substances Control Act. Implementing EPA regulations govern the manufacturing, processing, distribution, use and disposal of PCBs.

Most recreation areas will have no involvement with PCBs except as it may be contained in electrical transformers present either on transmission lines crossing recreation areas or in facilities such as restaurants or lodgings. If PCB transformers are present in these or other circumstances, recreation area managers must be concerned with accidental releases of PCBs and inspection of the transformers.

Electrical transformers occasionally explode, releasing PCBs to the environment. If this occurs in a recreation area and the transformer is operated by the area or the operator is unable or unwilling to respond, disposal could be the responsibility of the recreation manager. EPA regulations require that the release of PCB and PCB-contaminated soil and water must be disposed of in an incinerator, landfill, or high efficiency boiler meeting EPA criteria.

### **PCB Transformers**

EPA has recently imposed inspection requirements pertaining to transformers containing PCBs. At the present, transformers containing PCBs must be inspected at certain intervals and records of the inspections must be kept. The schedule of inspection is determined by the concentration of PCB and proximity of the transformer to food and feed products.

A transformer containing more than 50 ppm of PCB which poses an exposure risk to food or feed products must be inspected once a week. Any

transformer containing more than 500 ppm of PCBs must be inspected at least once every three months. In either case, if a leak in which PCBs run off the external surface of the transformer occurs, servicing must begin within two business days.

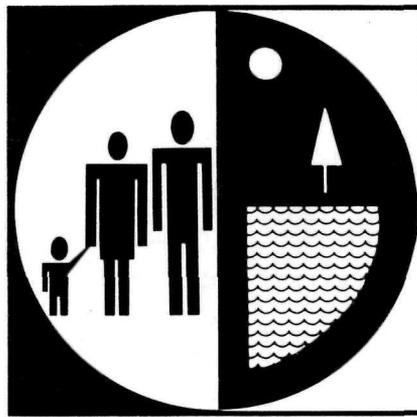
The phrase "exposure risk to food or feed product" has important implications for the inspection schedule. Any facility manufacturing, processing, packaging or holding human food or animal feed, except retail establishments such as grocery stores and restaurants, are contemplated within the phrase. Thus, although a PCB transformer in a lodge which serves food may not pose an exposure risk, that lodge's food storage facilities might be considered differently.

As this short discussion has shown, the legislative purposes of RCRA, Superfund and the Toxic Substances Control Act, which recognize the dangers of hazardous materials, have spawned extensive regulatory programs. Recreation area managers can view these regulations either as constraints on hazardous waste management practices or as mechanisms for channeling hazardous waste management into practices which protect recreation area visitors, resources and the general public. The better, and more positive view is that by accepting hazardous waste regulations as guides, the recreation manager is accomplishing this vital aspect of his or her role.

*Frank J. Ruswick, Jr. is an Attorney-Advisor in the Division of Conservation and Wildlife, Office of the Solicitor, U.S. Department of the Interior.*

# NRPA Maintenance Management Resources

by Kent J. Blumenthal



## NATIONAL RECREATION AND PARK ASSOCIATION

Thousands of park and recreation environmentalists, planners, programmers, researchers and others are responding to the numerous challenges that confront them, including current national economic realities and decisions made by government officials on park policies and priorities. Facing us are issues and actions that will mold the park and recreation future of tomorrow.

In view of the current Administration's "New Federalism" initiatives, the National Recreation and Park Association (NRPA), its branch affiliates and combined membership, is working to fill the "information void" inherent in any redirection of monies or Federal administrative efforts. The current emphasis on private-sector involvement in providing services has kept the Association busy meeting the information needs of park and recreation practitioners and the public-at-large. Fortunately, NRPA's efforts continue to meet with success.

### Maintenance Management Schools

In the maintenance management arena, success has been most evident. NRPA established its first Maintenance Management School in 1971 in cooperation with the North Carolina State University. In 1982, three Maintenance Management Schools will be conducted by NRPA in West Virginia, Washington and Colorado. Also, a regional maintenance workshop will be conducted in Georgia. Each school has its own Board of Regents and a two-year curriculum. The curriculum's course content will include such subject areas as Planning and Organizing the Maintenance Program, Elements of Parks and Recreation Maintenance, Supervising Maintenance Personnel, Maintenance and Operation Programs, and Building and Structure Maintenance. NRPA's Maintenance

Management Schools are of limited enrollment, and are part of a broad spectrum of continuing education workshops and institutes conducted by the Association.

The need for new workshops, schools or institutes is determined by either of the Association's semi-autonomous Regional Councils representing the 8 regions of NRPA. Other programs sponsored by the NRPA and endorsed by the Regional Councils include Innovative Programming Forums, a National Computer Workshop, Youth Sports Forums, the new Leisure and Aging Management School, and Revenue Sources Management Schools. While college credit is offered for some of the schools, continuing education units (CEU's) are now offered for each. CEU's are nationally recognized indicators of one's participation in continuing education programs. Questions concerning any of the management schools should be addressed to NRPA's new headquarters at 3101 Park Center Drive, Alexandria, VA 22302, telephone: (703) 820-4940.

### APRISE

New computer hardware recently purchased by the Association has facilitated the development of a new project called A Park and Recreation Information Service (APRISE). Currently limited to bibliographic searching, APRISE will have operational its own data base and information retrieval system by the close of calendar year 1982. As previously designed, data will be catalogued by subject area to reflect an "applied research" approach to problem solving. In the area of

park planning research, maintenance, safety and management, special consideration will be given to identification and documentation of successful programs and projects facilitating information sharing among agencies and individuals.

Research documents now available through NRPA's Joseph Lee Memorial Library and Information Center will be added to the computer system, enhancing the capability for easy, yet comprehensive information retrieval. This service will be provided to both members and non-members of the Association on an at-cost basis.

### NRPA Congress

One of the largest and most comprehensive nationally recognized educational events sponsored by NRPA is the Annual Congress for Recreation and Parks. This 5-day event provides an outstanding opportunity for all persons involved with park resource management to come together and discuss issues facing our field. Each of NRPA's seven professional branch affiliates shares in the development of the Congress' educational sessions. These include the Armed Forces Recreation Society, American Park and Recreation Society, Citizen-Board Member Branch, National Society for Park Resources, National Therapeutic Recreation Society, Society of Park and Recreation Educators, and the NRPA Student Branch.

Last year's 1981 Congress for Recreation and Parks in Minneapolis, Minnesota, was the most successful ever, with thousands of delegates attending. The delegates, representing each of the Association's seven branches, discussed and considered a wide range of social, political and economic problems, and identified solutions and alternatives. Congress Program Committee Chairman and NSPR board



National Recreation and Park Association

*The 1981 National Recreation and Park Association's annual Congress was held in Minneapolis (MN).*

member Cliff French of the Hennepin County Park Reserve District, Minnesota, gave strong leadership in determining quality Congress educational sessions. Included were educational sessions on Interpretive Techniques, Maintenance Operations—Scheduling Systems; Research as a Tool for More Effective Park and Recreation Operations; Allocation of Resources; Park Maintenance Equipment—Demonstration and Evaluation; Recreation Planning and Assistance; and scores of others.

The 1982 Congress for Recreation and Parks will be held in Louisville, Kentucky, on October 24-29, and promises even greater in-depth training and educational sessions. Congress Chairman Fred Humphrey of the University of Maryland has indicated support for the first National Society for Park Resources Institute to be held in conjunction with the Congress. Although the institute's curriculum content is still under consideration, it is certain to include comprehensive in-

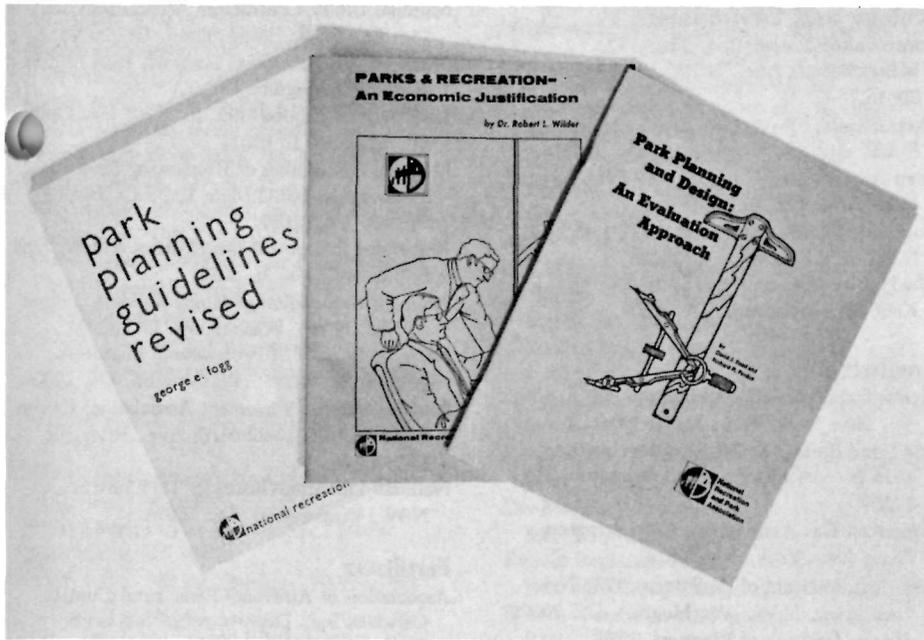
formation on park maintenance and operations, management and computer applications. Continuing Educational Units will be offered by the Association for participation in this and other institutes. Offered for the first time on an experimental and voluntary basis at the 1981 Congress for Recreation and Parks in Minneapolis, the CEU program was extremely successful.

### **NRPA Exposition**

The National Recreation and Park Association's Exposition, the world's largest exhibition of equipment, supplies and services for the field of parks and recreation, is conducted as an information portion of the Association's Annual Congress for Recreation and Parks. The exposition includes exhibitors from the most important firms catering to the leisure field, displaying their newest products and services. Anyone interested in maintenance management will find it highly beneficial.

### **Speakers Bureau**

The branch structure of the Association has allowed for the consolidation of ideas and the sharing and dissemination of information among many professionals facing similar problems and issues. The American Park and Recreation Society (APRS), and the National Society for Park Resources (NSPR) have each developed a Speakers Bureau from among their respective membership. Two years ago APRS compiled a comprehensive document listing experts in such diverse areas as Recreation Programming and Park Planning Design. More recently, NSPR undertook a survey of its membership and has since published the survey results. A return rate of 15% was realized, considered high when compared to similar endeavors of other membership organizations. The results include a Speakers Bureau, listing individuals with expertise in several aspects of natural resources maintenance and



Walter Smalling

Recent publications available through the National Recreation and Park Association.

management, including concessions and contracts, environmental education, facility development, fees and charges, historic preservation, inter-governmental cooperation, and others. Detailed NSPR survey results and APRS Speakers Bureau information are available from NRPA headquarters.

### Park Maintenance Standards Project

The APRS/NSPR are co-sponsoring a Park Maintenance Standards Project (See Arthur T. Wilcox's article in this issue. Ed.). Working cooperatively since 1979 with the aid of a small Department of the Interior grant, these two NRPA branch affiliates have compiled comprehensive research and information in five areas of study:

1. Standardizing classification and terminology
2. Uniform measurements for maintenance production
3. Maintenance safety standards
4. Design standards for maintenance
5. Maintenance Data Collection and Retrieval System.

Co-chaired by Ron Donahue (APRS) and Art Wilcox (NSPR), the PMSP Committee determined that research emphasis should be placed on Outdoor Park Maintenance, with

research results published specifying those principles of maintenance having widespread applications. The five PMSP publications will be made available through NRPA when the project is completed, near the end of 1982.

### Cooperative Publications

In serving the information needs of researchers and practitioners alike, the Association has stepped up its new publications thrust. Actively soliciting quality manuscripts that address all areas of parks and recreation, NRPA is co-sponsoring the publication of needed resource materials with park and recreation organizations and professionals on a cost-effective basis. The process is quite simple. Camera-ready copy is received by the Association and sent to a panel of experts for their review prior to publication. Editorial alterations, if required, are completed by the author, and are re-submitted to NRPA for printing. Credit is given by the Association to the author and/or co-sponsoring agency, institution or NRPA branch affiliate assisting with the project.

All publications are published and marketed by NRPA, and are sold at-cost through the NRPA Publications Center. Publications recently released include *Park Planning & Design: An Evaluation Approach*; *Parks and Recreation: An Economic Justification*;

the recently revised *Park Planning Guidelines*, and the new NRPA-USDA Forest Service publication *Cleaning Recreational Sites*.

The National Recreation and Park Association, its branch affiliates and its most valuable resource, its membership, are moving forward in their efforts to provide helpful and current information to all members of the park and recreation community.

*Kent J. Blumenthal, Assistant to the Deputy Director of the National Recreation and Park Association, is Executive Secretary of the National Society for Park Resources and is responsible for many of the Association's Technical Assistance functions.*

# Who Can You Turn To?

## Agronomy

- American Forage and Grassland Council, 121 Dantzler Court, Lexington, KY 40503.  
American Society of Agronomy, 677 S. Segoe Road, Madison, WI 53711.  
Crop Science Society of America, 677 Segoe Road, Madison, WI 53711.  
Soil Conservation Society of America, 7515 N.E. Ankeny Road, Ankeny, IA 50021.  
Soil Science Society of America, 677 S. Segoe Road, Madison, WI 53711.

## Architecture

- American Institute of Landscape Architects, 6810 North 2nd Place, Phoenix, AZ 85012.  
American Society of Landscape Architects, 1750 Old Meadow Road, McLean, VA 22101.

## Botany

- American Assn. of Botanical Gardens & Arboreta, Inc., Horticulture Dept., New Mexico State Univ., Las Cruces, NM 88003.  
Botanical Society of America, New York Botanical Garden, Bronx, NY 10458.

## Bulbs

- All-America Gladiolus Selections, 3008 Centralia Ct., Jeffersonville, IN 47130.

## Construction

- American Land Development Association, 604 Solar Bldg., 1000 16th St., N.W., Washington, DC 20036.  
Arizona Landscape Contractors, Assn., 326 W. Cambridge Ave., Phoenix, AZ 85003.  
Associated Landscape Contractors of America, Inc., 1750 Old Meadow Road, McLean, VA 22101.  
Associated Landscape Contractors of Oregon, 222 S.W. Harrison St., Suite GA-7, Portland, OR 97201.  
Associated Landscape Designers and Contractors, 702 N. 65th St., Seattle, WA 98103.  
California Landscape Contractors Assn., Inc., 6252 E. Telegraph Rd., Los Angeles, CA 90040.  
Golf Course Builders of America, 806 15th St., N.W., Washington, DC 20005.  
Illinois Landscape Contractors Assn., Box 484, Bloomington, IL 60108.  
Minnesota Landscape Maintenance Assn., Inc., 6643 Colfax Ave. N., Minneapolis, MN 55430.  
Ornamental Growers Assn., 645 N. Milwaukee Ave., Wheeling, IL 60090.  
Professional Landscape Contractors of Ohio, 2265 Green Road, Cleveland, OH 44121.  
Texas Landscape Contractors Assn., 7700 Northaven Road, Dallas, TX 75230.  
Wisconsin Landscape Contractors Assn., 4209 35th St., Milwaukee, WI 53211.

## Ecology and Environment

- Conservation Foundation, The 1717 Massachusetts Ave., N.W., Washington, DC 20036.  
Environmental Protection Agency, Office of Public Affairs, Washington, DC 20460.  
Keep America Beautiful, Inc., 99 Park Avenue, New York, NY 10016.  
National Wildlife Federation, 1412 16th St., N.W., Washington, DC 20036.  
The Nature Conservancy, Suite 800, 1800 N. Kent St., Arlington, VA 22209.

## Engineering

- Acoustical Materials Association, 335 E. 45th St., New York, NY 10017.  
Air Conditioning & Refrigeration Institute, 1815 N. Fort Meyer Drive, Arlington, VA 22209.  
American Gas Association, 420 Lexington Ave., New York, NY 10016.  
American Institute of Architects, 1735 New York Ave., N.W., Washington, DC 20006.  
American Institute of Planners, 1776 Massachusetts Ave., N.W., Washington, DC 20036.  
American Management Association, 135 W. 50th St., New York, NY 10020.  
American Society of Heating, Refrigerating & Air Conditioning Engineers, Inc., 345 E. 47th St., New York, NY 10017.  
American Society of Mechanical Engineers, 345 E. 47th St., New York, NY 10017.  
American Society for Testing Materials, 1916 Race St., Philadelphia, PA 19103.  
Asphalt and Vinyl Asbestos Tile Institute, 101 Park Ave., New York, NY 10017.  
Associated General Contractors of America, 1957 E St., N.W., Washington, DC 20006.  
Association of American Soap & Glycerine Producers, Inc., 295 Madison Ave., New York, NY 10017.  
Building Research Institute, 2100 Pennsylvania Ave., N.W., Washington, DC 20037.  
Carpet Institute Inc., 350 5th Ave., New York, NY 10017.  
Chemical Specialties Manufacturers Association, 50 E. 41st St., New York, NY 10017.  
Copper & Brass Research Association, 420 Lexington Ave., New York, NY 10016.  
Fire Equipment Manufacturers Association, Inc., One Gateway Center, Pittsburgh, PA 15222.  
Institute of Sanitation Management, 55 W. 42nd St., New York, NY 10036.  
National Board of Fire Underwriters, 85 John St., New York, NY 10038.  
National Electric Contractors Association, 7315 Wisconsin Ave., Bethesda, MD 20910.  
National Electrical Manufacturers Association, 155 E. 44th St., New York, NY 10017.  
National Fire Protection Association, 60 Batterymarch St., Boston, MA 02110.  
National Safety Council, 425 N. Michigan Ave., Chicago, IL 60601.  
National Sanitary Supply Association, Inc., 159 N. Dearborn St., Chicago, IL 60601.  
National Terrazzo and Mosaic Association, 24 West Loudoun St., Leesburg, VA 22075.

- National Utility Contractors Association, 815 15th St., N.W., Washington, DC 20005.  
Structural Clay Products Institute, 1520 18th St., N.W., Washington, DC 20036.  
Underwriters Laboratories, Inc., 207 East Ohio St., Chicago, IL 60611.  
National Association of Reinforcing Steel Contractors, 10533 Main St., P.O. Box 225, Fairfax, VA 22030.  
Associated Equipment Distributors, 615 W. 22nd St., Oak Brook, IL 60521.  
National Association of Home Builders, 15th & M Sts., N.W., Washington, DC 20005.  
National Society of Professional Engineers, 2029 K St., N.W., Washington, DC 20006.  
National Asphalt Pavement Association, Calvert Building, 6811 Kenilworth Ave., Riverdale, MD 30840.  
National Limestone Institute, 1315 16th St., N.W., Washington, DC 20036.

## Fertilizers

- Association of American Plant Food Control Officials, Inc., Department of Biochemistry, Purdue University, West Lafayette, IN 47907.  
Association of Official Analytical Chemists, P.O. Box 540, Benjamin Franklin Sta., Washington, DC 20044.  
Fertilizer Institute, The, 1015 18th St., N.W., Washington, DC 20036.  
National Fertilizer Solutions Assn., 1701 W. Detweiller Drive, Peoria, IL 61614.  
Potash Institute of North America, Inc., 1649 Tullie Circle, N.E., Atlanta, GA 30329.

## Florists

- Society of American Florists, 901 N. Washington St., Alexandria, VA 22314.

## Flowers—Plants

- All-America Rose Selections, Inc., P.O. Box 218, Shenandoah, IA 51601.  
All-America Selections, Box 1, Gardenville, PA 18926.  
American Begonia Society, 14036 Ramona Dr., Whittier, CA 90605.  
American Boxwood Society, The, P.O. Box 85, Boyce, VA 22620.  
American Camellia Society, Massee Lane, Box 212, Ft. Valley, GA 31030.  
American Dahlia Society, Inc., 345 Merritt Ave., Bergenfield, NJ 07621.  
American Fern Society, Biological Sciences Group, University of Connecticut, Storrs, CT 06268.  
American Hibiscus Society, P.O. Box 98, Eagle Lake, FL 33839.  
American Iris Society, The, Missouri Botanical Gardens, 2315 Tower Grove Ave., St. Louis, MO 63110.  
American Orchid Society, Inc., Botanical Museum of Harvard Univ., Cambridge, MA 02138.  
American Plant Selections, 4331 N. Front St., Harrisburg, PA 17110.  
American Primrose Society, 14015 84th Ave., N.E., Bothell, WA 98011.  
American Rhododendrum Society, 2232 N. 78th Ave., Portland, OR 97213.  
American Rose Society, P.O. Box 30,000, Jefferson-Paige Road, Shreveport, LA 71130.

**Bedding Plants, Inc.**, 1421 Cedarhill Dr., East Lansing, MI 48823.

**Bromeliad Society, The**, 647 S. Sahair Ave., Los Angeles, CA 90049.

**Cactus & Succulent Society of America, Inc.**, 2631 Fairgreen Ave., Arcadia, CA 91006.

**Herb Society of America**, 300 Massachusetts Ave., Boston, MA 02115.

**Holly Society of America, Inc.**, 407 Fountain Green Rd., Bel Air, MD 21014.

**National Association of Plant Patent Owners**, 230 Southern Building, 15th & H Sts., N.W., Washington, DC 20005.

**National Chrysanthemum Society, Inc., USA**, 394 Central Avenue, Mountain Side, NJ 07092.

**National Fuchsia Society**, 10934 E. Flory St., Whittier, CA 90606.

**North American Gladiolus Council**, 30 Highland St., Peru, IN 46970.

**North American Lily Society, Inc.**, North Ferrisburg, VT 05473.

**Orchids, Inc.**, 3555 E. Douglas, Wichita, KS 67218.

**Roses, Inc.**, 1152 Haslett Road, Haslett, MI 48840.

## Gardening

**Garden Centers of America**, 230 Southern Building, 15th & H Sts., N.W., Washington, DC 20005.

**Garden Writers Assn. of America**, 101 Park Ave., Room 607, New York, NY 10017.

**International Garden Club, Inc.**, Bartow-Pell Mansion, Museum & Garden, Pelham Bay Park, New York, NY 10464.

**Women's Garden Clubs of America**, 5560 Merle May Rd., Des Moines, IA 50323.

**National Council of State Garden Clubs, Inc.**, 4401 Magnolia Ave., St. Louis, MO 63110.

**National Garden Bureau**, Box 1, Gardenville, PA 18926.

**Professional Grounds Management Society**, 1750 Old Meadow Road, McLean, VA 22101.

## Horticulture

**American Horticulture Society**, Mt. Vernon, VA 22121.

**American Society for Horticultural Science**, National Center for American Horticulture, Mount Vernon, VA 22121.

**Horticultural Dealers Assn., Inc.**, 99 Church St., New York, NY 10007.

**Horticulture Research Institute, Inc.**, 230 Southern Bldg., Washington, DC 20005.

## Irrigation

**Irrigation Technical Services**, P.O. Box 268 Lafayette, CA 94549.

**Sprinkler Irrigation Assn.**, Suite 310, 13975 Connecticut Ave., Silver Spring, MD 20906.

## NRPA Maintenance Management Resources

See article this issue. For further info, contact:  
NRPA Headquarters  
3101 Park Center Drive  
Arlington, VA 22302

## Nursery and Landscaping

**Alabama Nurserymen's Assn.**, 860 Terrace Acres, Auburn, AL 36830.

**American Assn. of Nurserymen, Inc.**, 230 Southern Bldg., Washington, DC 20005.

**American Nurserymen's Protective Assn., R.R. 2**, Box 25, Indianapolis, IN 46231.

**American Rock Garden Society**, 90 Pierpont Road, Waterbury, CT 06705.

**Arizona Nurserymen's Assn.**, 326 W. Cambridge, Phoenix, AZ 85003.

**California Association of Nurserymen**, 1005 Eighth St., Sacramento, CA 95814.

**Canadian Nursery Trades Association**, 1568 Carling Ave., Ottawa, Canada K1Z7M5.

**Colorado Nurserymen's Assn.**, 1814 S. Meade, Denver, CO 80219.

**Connecticut Nurserymen's Assn.**, P.O. Box 352, West Haven, CT 06516.

**Del-Mar-Va Association of Nurserymen**, Box 306, Selbyville, DE 19975.

**Eastern Regional Nurserymen's Assn.**, 101 Executive Blvd., Elmsford, NY 10523.

**Florida Nurserymen & Growers Assn.**, 2016 S.W. 27th Terrace, Ft. Lauderdale, FL 33312.

**Georgia Nurserymen's Assn.**, 190 Springtree Road, Athens, GA 30601.

**Greater Atlanta Nurserymen's Assn.**, 107 Lakeview Ave., N.E., Atlanta, GA 30305.

**Idaho Nursery & Tree Assn.**, 9707 Fairview Ave., Boise, ID 83704.

**Illinois State Nurserymen's Assn.**, 645 N. Milwaukee Ave., Wheeling, IL 60090.

**Indiana Association of Nurserymen, Inc.**, Entomology Hall, Purdue University, W. Lafayette, IN 47907.

**Iowa Nurserymen's Assn.**, 7261 N.W. 21st St., Ankeny, IA 50021.

**Kansas Association of Nurserymen**, 4707 W. 6th St., Topeka, KS 66606.

**Kentucky Nurserymen's Assn.**, Kentucky Agricultural Experiment Station, University of Kentucky, Lexington, KY 40506.

**Lake County Nurserymen's Assn.**, P.O. Box 135, Mentor, OH 44060.

**Louisiana Nurserymen's Assn.**, Box 4492, University of Southwestern Louisiana, Lafayette, LA 70501.

**Maryland Nurserymen's Assn.**, 2800 Elnora St., Silver Spring, MD 20902.

**Massachusetts Nurserymen's Assn.**, 715 Boylston St., Boston, MA 02116.

**Metropolitan Detroit Landscape Assn.**, P.O. Box 550, Wayne, MI 48184.

**Michigan Association of Nurserymen**, 5127 Aurelius Road, Lansing, MI 48910.

**Minnesota Nurserymen's Assn.**, Box 271, Hastings, MN 55033.

**Mississippi Nurserymen's Assn.**, P.O. Box 42, Lumberton, MS 39455.

**Missouri Association of Nurserymen**, 9850 Gravois, Affton, MO 63123.

**Montana Association of Nurserymen**, 1102 S. Grand Ave., Bozeman, MT 59715.

**National Landscape Assn.**, 230 Southern Bldg., Washington, DC 20005.

**Nebraska Assn. of Nurserymen**, 2342 S. 40th St., Lincoln, NE 68506.

**New England Nurserymen's Assn.**, P.O. Box 352, West Haven, CT 06516.

**New Hampshire Plant Growers Assn.**, R.F.D. 2, West Franklin, NH 03235.

**New Jersey Assn. of Nurserymen**, Dept. of Horticulture & Forestry, Rutgers University, New Brunswick, NJ 08903.

**New York State Nurserymen's Assn., Inc.**, 101 Executive Blvd., Elmsford, NY 10523.

**North Carolina Nurserymen's Assn.**, Box 5023 College Station, Raleigh, NC 27607.

**North Dakota Nurserymen's Assn.**, Highway 81, South Fargo, ND 58102.

**Ohio Nurserymen's Assn.**, 1540 W. 5th Ave., Columbus, OH 43212.

**Oklahoma Nurserymen's Assn.**, 4717 W. Park Place, Oklahoma City, OK 73127.

**Pennsylvania Nurserymen's Assn.**, Hilltop & Ridge Rds., Boiling Springs, PA 17007.

**Rhode Island Nurserymen's Assn.**, 339 Woodward Hall, University of Rhode Island, Kingston, RI 02881.

**South Carolina Nurserymen's Assn.**, Horticulture Dept., Clemson University, Clemson, SC 29631.

**South Dakota Nurserymen's Assn.**, P.O. Box 1014, Aberdeen, SD 57401.

**Southern Nurserymen's Assn.**, 3813 Hillsboro Rd., Room 227, Nashville, TN 37215.

**Tennessee Nurserymen's Assn.**, P.O. Box 57, McMinnville, TN 37110.

**Texas Assn. of Nurserymen**, 512 E. Riverside Dr., Suite 207, Austin, TX 78704.

**Utah Assn. of Nurserymen**, 3500 S. 9th East, Salt Lake City, UT 84106.

**Vermont Plantsmen's Assn.**, Reading, VT 05062.

**Virginia Nurserymen's Assn.**, Box 87, Rescue, VA 23426.

**Washington State Nurserymen's Assn., Inc.**, 1201 25th Ave., Ct., N.E., Puyallup, WA 98371.

**West Virginia Nurserymen's Assn.**, 415 Jefferson Rd., S. Charleston, WV 25309.

**Western Association of Nurserymen**, 9305 Vaughn, Raytown, MO 64133.

**Wholesale Nursery Growers of America, Inc.**, 230 Southern Bldg., Washington, DC 20005.

**Wisconsin Nurserymen's Assn.**, Jackson, WI 53037.

## Park Maintenance Standards Project (See article this issue.)

### Maintenance data collection/retrieval

Tom L. Davis  
State Recreation Extension Specialist, Colorado  
The Park Maintenance Standards Project  
233 Forestry Bldg, Colorado State University  
Fort Collins, CO 80523  
(303) 491-5812

### Standardizing classification/terminology

Robert D. Espeseth  
Outdoor Recreation Specialist  
Office of Recreation and Park Resources  
University of Illinois at Urbana  
312 Armory Building  
Champaign, IL 61820  
(217) 333-1824

Ed Harvey  
Director of Operations  
Champaign Park District  
706 Kenwood Road  
Champaign, IL 61820  
(217) 352-0071

#### Maintenance safety standards

James Bossi  
Developed Recreation Site Specialist  
US Forest Service  
PO Box 2417  
Washington, DC 20013  
(202) 447-2311

#### Uniform measurements for maintenance production

Theodore Haskell  
Associate Professor  
Dept. of Parks and Recreation Resources  
Michigan State University  
East Lansing, MI 48823  
(517) 355-1855

#### Park Practice Program

*Trends.* See inside back cover for previous issues.

#### Pest Control

Assn. of American Pesticide Control Officials, Inc., 1615 S. Harrison Road, East Lansing, MI 48823.

Chemical Specialties Manufacturers Assn., 1001 Connecticut Ave., N.W., Washington, DC 20036.

CPI (Crop Protection Institute) Biological Research Center, P.O. Drawer S, Durham, NH 03824.

Entomological Society of America, 4603 Calvert Road, College Park, MD 20740.

National Agricultural Chemicals Assn., 1155 15th St., N.W., Washington, DC 20005.

National Assn. of Insect Electrocuter Manufacturers, P.O. Box 150, Clinton Corners, NY 12514.

National Pest Control Assn., 8150 Leesburg Pike, Suite 1100, Vienna, VA 22180.

National Sprayer and Duster Assn., 680 Wrigley Bldg., N., 410 N. Michigan Ave., Chicago, IL 60611.

Weed Science Society of America, 425 Illinois Bldg., 1113 N. Neil St., Champaign, IL 61820.

#### Power Equipment—Parts

Automotive Service Industry Assn., 230 N. Michigan Ave., Chicago, IL 60601.

Maryland Lawn Mower Dealers Assn., Inc., P.O. Box 68, Kingsville, MD 21084.

Outdoor Power Equipment Institute, Inc., Suite 903-05, 1725 K Street N.W., Washington, DC 20006.

Power Saw Manufacturers Association, P.O. Box 7256, Belle View Station, Alexandria, VA 22307.

#### Seed/Soil

American Rhododendron Society, 2232 N.E. 78th Ave., Portland, OR 97213.

Atlantic Seedsmen Assn., 101 Park Ave., New York, NY 10017.

Better Lawn and Turf Institute, 991 W. Fifth St., Marysville, OH 43040.

Cultivated Sod Association of New Jersey, Cook College, Rutgers University, New Brunswick, NJ 08903.

Delaware Turfgrass Assn., Agriculture Hall, Univ. of Delaware, Newark, DE 19711.

Florida Turfgrass Assn., 903 Lee Rd., Orlando, FL 32810.

Highland Colonial Bentgrass Comm., Dept. G., Suite One, Rivergrove Bldg., 211 Front St., N.E., Salem, OR 97303.

Manhattan Ryegrass Growers Assoc., P.O. Box 415, Hubbard, OR 97032.

Merion Bluegrass Assn., 101 Park Ave., Rm. 607, New York, NY 10017.

New Jersey Turfgrass Assn., P.O. Box 231, New Brunswick, NJ 08903.

Oregon Chewings and Creeping Red Fescue Commission, 1349 Capitol St., N.E., Salem, OR 97303.

Oregon Highland Colonial Bentgrass Commission, 2111 Front St., N.E., Salem, OR 97303.

Oregon Ryegrass Growers Seed Commission, 2111 Front St., N.E., Salem, OR 97303.

Society of Commercial Seed Technologists, Colborn Seed Testing Service, 2600 Woods Blvd., Lincoln, NE 68502.

Sod Growers Assn. of Michigan, 60 Rush Lake Rd., Pickney, MI 48169.

Sod Growers Assn. of Mid-America, 15515 Wolf Rd., Orlando Park, IL 60462.

#### Soil Conditioners

Peat Producers Assn. of the United States, 1224 17th St. N.W., Washington, DC 20036.

Perlite Institute Inc., 45 W. 45th St., New York, NY 10036.

U.S. National Committee of the International Peat Society, 2202 Washington Ave., Silver Spring, MD 20910.

#### Trees

American Forest Institute, 1619 Massachusetts Ave., N.W., Washington, DC 20036.

International Shade Tree Conference, Inc., P.O. Box 71, 3 Lincoln Sq., Urbana, IL 61801.

National Arborist Assn., 3537 Stratford Road, Wantagh, NY 11793.

National Christmas Tree Assn., 225 E. Michigan St., Milwaukee, WI 53202.

#### Turf Research

Central Plains Turfgrass Foundation, Waters Hall, K.S.U., Horticulture, Manhattan, KS 66506.

Oklahoma Turfgrass Research Foundation, Inc., 115 Life Science East, Oklahoma State University, Stillwater, OK 74074.

Turf Research Foundation, 101 Park Ave., New York, NY 10017.

## Publications

### Design, Adaptive Use & Economics *Adaptive Use*

Urban Land Institute, Washington, DC, 1978, hardcover, 256 pp.

Annotated compilation of 180 adaptive use projects across the country. Explains major components of adaptive use process

*Architecture in Context, fitting new buildings with old*

Brent C. Brodin, Van Nostrand Reinhold Co., 1980, hardcover, 160 pp.

A design aid analyzing the relationship of new and old buildings.

*Business and Preservation, A survey of Business Conservation of Buildings and Neighborhoods* Inform, NY, 1978, paper, 259 pp.

Seventy-one case studies presented of adaptive reuse, continued use, new additions, residential revitalization, commercial redevelopment and general preservation support.

*Economic Benefits of Preserving Old Buildings* Preservation Press, 1979, paper, 168 pp.

Shows how recycling saves money. Examples of projects big and small, public and private.

*Old & New Architecture: Design Relationship*

G. Cavaglieri, M. Graves, J. Conron, E. Beasley, et al, Preservation Press, 1980, hardcover, 280 pp.

Managing change is examined by eighteen architects and preservationists who address building relationships, design guidelines, historic district controls in theory and practice.

### Fire Safety

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