

**PUBLISHERS NOTE: BOTH THE
INSTRUCTOR'S GUIDE AND THE
POWERPOINT PRESENTATION ARE GOING
THROUGH EDITORIAL PHASES, WHEN THIS
IS FINALIZED UPDATED FILES WILL BE
POSTED**

**PARK AND RECREATION
MAINTENANCE
MANAGEMENT
4TH Edition**

Instructor's Guide

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INTRODUCTION

This Instructor's Guide is provided to assist in the use of Park and Recreation Maintenance Management, Fourth Edition. Enclosed in this Guide are chapter outlines, discussion questions, instructional resources, and several suggested class assignments related to the development and management of a maintenance management program for a park and recreation agency. The chapter outlines correspond with the respective power point presentations, enabling instructors to review materials to be covered in class in an efficient manner.

The CD-Rom accompanying this instructor's manual includes a copy of A Pro-active Outdoor Recreation Management Apportionment Strategy Excel spreadsheet application designed by Dr. Chrystos Siderelis and Scott Payne. This spreadsheet application has been provided to local government park and recreation departments in North Carolina via NC State University Department of Parks, Recreation and Tourism Management's Recreation Resources Service (RRS). RRS is a technical assistance program offered through a cooperative partnership between the N.C. Division of Parks and Recreation and the N.C. State University Department of Parks, Recreation and Tourism Management.

The spreadsheet has been designed to follow key principles of a park maintenance management plan; task allocation and cost allocation. The apportionment strategy worksheet utilizes the integer goal program for optimal apportionment strategy for park operations referenced in Chapter 3. This spreadsheet may be customized by the instructor to use with the project from the Parks and Recreation Maintenance Management School. The spreadsheet may also be linked/integrated with an ESRI ArcGis exercise.

The authors recognize the unique teaching style of every faculty member. As such, the focus of the Instructor's Guide is limited to basic materials that have proven to be helpful to the authors; allowing opportunities for instructors to develop supplementary materials, specific test questions, and other teaching resources and techniques that fit their respective teaching style and curricula. The authors wish to thank Dr. James Drummond, Elon University; and Dr. Aram Attarian, North Carolina State University, for their input and suggestions.

In addition, we would like to thank current and former regents of the Maintenance Management School at Oglebay Park, Wheeling, W.Va., for their efforts in developing a curriculum in park and recreation maintenance management, and for developing topical monographs that were helpful in providing this updated edition.

Chapter 1

Maintenance Principles

Suggested Discussion/Test Questions

1. Define maintenance and operations.
2. Differentiate between maintenance objectives and standards
3. What is a maintenance principle?
4. Why is good maintenance important to the park and recreation agency?
5. Discuss some of the ways good or bad design and construction can affect maintenance management.
6. What is preventive maintenance?
7. Discuss the park and recreation professional's responsibility toward the natural environment.
8. Describe the maintenance employee's role in public relations

Chapter Outline (corresponds with power point presentation)

- The Role of Park and Recreation Service
- Maintenance and Operations – Defined
- Guidelines for Establishing a Maintenance Program

Historical Perspective

- Hanging Gardens of Babylon
- Greco-Roman Parks
- Early European Parks
- United States
- Boston Commons
- Central Park

Park and Recreation Services

- Concept of Leisure and Recreation
- Changing Recreation Patterns
 - Population Changes
 - Urbanization
 - Transportation
 - Wealth vs. Poverty
 - Education

- Environment
- Immigration
- Social Changes
- Employment

Maintenance and Operations

“...keeping park and recreation areas and facilities in their original state or as nearly so as possible.”

Includes:

- Routine maintenance
- Recurring maintenance
- Repairs
- Minor construction

Goal: Optimum public use of park and recreation areas and facilities

- Directed programs
 - Day camps
 - Organized sports leagues
 - Instructional programs
- **Self-directed programs**
 - Hiking
 - Golf
 - Playgrounds
 - Picnic areas

Guidelines for Establishing a Maintenance Program

1. Establish maintenance objectives and standards.
2. Performed maintenance with economy of time, personnel, equipment, and materials.
3. Maintenance operations should be based on a sound written maintenance plan.
4. Scheduling maintenance work must be based on sound policies and priorities.
5. Place high emphasis on preventive maintenance.
6. The maintenance department must be well organized
7. Provide adequate fiscal resources.
8. Provide adequate personnel.

9. Protect the natural environment.
10. Assume responsibility for public and employee safety.
11. Maintenance should be a primary consideration in the design and construction of park and recreation facilities.
12. Maintenance employees are responsible for the public image of the park and recreation agency.

1. Maintenance Objectives and Standards Must be Established

- Objectives – Examples
 - Park and recreation areas and facilities should have a clean, orderly appearance at all times.
 - Areas and facilities that are aesthetically pleasing should be developed and maintained.
 - Areas and facilities should be maintained to create a healthful and safe environment.
 - Maintenance should promote good public relations by providing areas and facilities where people have an opportunity for an enjoyable leisure experience.
- Standards – *What do you mean?*
 - Maintenance standards describe the conditions that will exist when maintenance tasks have been successfully completed.
 - Maintenance standards describe the acceptable condition of areas and facilities.
 - Maintenance standards should be developed for ALL areas and facilities.
 - Standards define the quality of the maintenance program.

2. Maintenance should be performed with economy of time, personnel, equipment, and materials

- Economy of personnel – Optimum number of workers
- Economy of equipment – The proper equipment for each task
- Economy of materials – Appropriate materials for each task

3. Maintenance operations should be based on a written maintenance plan.

- Why?

- Provides a systematic approach in accomplishing maintenance work.
- Provides a sound method of justifying budget requests.
- Serves as a communication device for agency administrators.
- Tips:
 - Involve entire maintenance staff
 - The plan should be revised as conditions change
 - Do not compromise quality

4. Scheduling Maintenance Work Must be Based on Sound Policies and Priorities

- Establish guidelines and criteria to help in setting priorities for maintenance work.
- Considerations:
 - Program interruption
 - Participant and employee safety
 - Security issues
 - Costs
 - Public perception
 - Employee skills
 - Special equipment needed

5. Place High Emphasis on Preventive Maintenance

- Preventive Maintenance
- Defined: continuous attention and care to prevent damaging wear and costly repairs.
- Purpose: to get optimum life from facilities and equipment.
- Examples:
 - Changing oil, lubricating
 - Replace worn parts before they fail
 - Resurface courts at first signs of wear
 - Replace light bulbs at their predicted life span

6. The Maintenance Department Must Be Well Organized

- Organization necessary for efficiency and effectiveness with...
 - Personnel
 - Equipment

- Materials
- Time

7. Provide Adequate Fiscal Resources to Support the Maintenance Program

- Maintenance is typically 60-80% of a park and recreation agency's operating budget.
- Develop evidence to justify maintenance needs.
- Good policy: "If you can't maintain it, don't build it."

8. Provide Adequate Personnel

- Recommended approach:
 - Hire quality personnel
 - Provide a good orientation program
 - Inform employees of the importance of their work
 - Provide training
 - Provide good supervision
 - Communicate with administrators and leaders the importance of maintenance employees and their work

9. Design the Maintenance Program to Protect the Natural Environment

- Elements of environmental protection:
 - Good land use planning
 - Control level of development
 - Appropriateness of development
 - Quality of development
 - Minimize environmental damage
 - Create natural beauty
 - Good maintenance practices

10. Assume Responsibility for Public and Employee Safety

- Provide safe areas and facilities
- Maintain good accident reporting system
- Take actions to avoid future occurrences
- Train staff to look for potential threats to safety
- Train staff how to report accidents
- Inspect work sites and recreation areas and facilities for potential hazards.

11. Maintenance Should be a Primary Consideration in the Design and Construction of Park and Recreation Facilities

- Use appropriate building materials:
 - Durable
 - Easy to maintain
 - Easy to repair
 - Easy to replace
 - Blend with nature

12. Maintenance Employees are Responsible for the Public Image of the Park and Recreation Agency.

- Maintenance employees should present a positive image
- Well-kept facilities creates a positive image
- Maintenance employees should be able to assist public as needed
- Train maintenance employees how to relate with public

Chapter 2

Planning and Organizing the Maintenance Program

Suggested Discussion/Test Questions

1. Describe a maintenance impact statement, its purpose and justification.
2. Outline steps that should be followed in developing a recreation park maintenance program.
3. Describe the purpose of a descriptive inventory of areas and facilities, indicating the various considerations to be included in such an inventory for maintenance purposes.
4. Describe the advantages to be gained in developing a routine maintenance plan utilizing the table format.
5. Explain the purpose of a work order system.
6. Identify and explain the elements included in an acceptable work order system.
7. Identify three basic personnel organization methods for assigning maintenance work.
8. Describe the several methods available to the maintenance manager to estimate maintenance job time.
9. In the overall job of maintenance work scheduling, describe the techniques that might be utilized to keep track of work backlog.
10. Describe the purpose of preventive maintenance and its source of supporting information.
11. Hiring temporary help, hiring a private contractor, or increasing the labor force permanently are possible remedies to alleviate maintenance and repair work backlog. Cite justification for each of the three remedies.
12. In developing an effective maintenance work schedule, what factors should be considered as the schedule is being developed?
13. Contrast the purposes, methodology, and appropriate applications of (1) work load/cost tracking, (2) job sampling, and (3) group timing technique (GTT).
14. What is a standard cost for a given maintenance operation and what potential use is a standard cost to the maintenance manager?
15. Describe the purpose of cost accounting and indicate the most valid application of cost accounting at present.
16. What is the greatest potential danger to a particular recreation area or facility when standardization and unit cost comparisons are exclusively relied upon to affect economies.

Chapter Outline (corresponds with power point presentation)

Contents of a Maintenance Plan

- An inventory of areas, facilities, equipment to be maintained.
- A routine maintenance plan including:
- A means for accomplishing nonroutine, nonrecurring maintenance work/

- Preventive maintenance for conditions that may accelerate wear and deterioration as determined by inspections.
- A schedule for assigning responsibility for each maintenance job.
- A system for job design and planning, scheduling of work, and workload control.
- A system of cost analysis and controls.

1. Facility and Equipment Inventory

- Include:
 - Existing areas, facilities, and equipment
 - Use patterns (daily, weekly, etc.)
 - Type, sizes, special features and condition of each area and facility
 - A site map with measurements for all areas and facilities

(Example – Appendix A)

**FAIRFAX COUNTY PARK AUTHORITY
MAINTENANCE MANAGEMENT SYSTEM INVENTORY FORM**

PARK NAME: _____ PARK MANAGEMENT AREA: _____
TAX MAP: _____ TOTAL ACRES: _____ MOWING AREAS: _____
SUPERVISORY DISTRICT: _____ MOWING CLASS: _____

BALLFIELD

Size _____ (feet)
Lights: Yes / No
Irrigation: Yes / No
Maintenance Level: _____
Overlay: Yes / No
Back Stop: Yes / No
No. of Benches: _____

SOCCER/FOOTBALL FIELD

Lights: Yes / No
Irrigation: Yes / No
Maintenance Level: _____
Overlay: Yes / No
No. of Bleachers _____
No. of Benches _____

TENNIS COURTS

No. of Courts _____
Lights: Yes / No
No. of Benches _____

MULTI-USE COURTS

No. of Courts _____
Lights: Yes / No
No. of Benches _____

PLAYGROUND / TOT LOT

No. of Acres _____
No. of Benches _____
No. of Grills _____

PICNIC AREA

No. of Acres _____
No. of Benches _____

PARKING – ASPHALT

No. of Spaces _____
No. of Handicap Spaces _____
Lights: Yes / No
Lights: Yes / No

ROADS – ASPHALT

Type _____
(entrance, service)
Length _____ (feet)

PARKING – GRAVEL

No. of Spaces _____
No. of Handicap Spaces _____
Lights: Yes / No

ROADS – GRAVEL

Type _____
(entrance, service)
Lights: Yes / No

SIDEWALKS

Length _____ (feet)

OPEN PLAY AREA

No. of Acres _____

Lights: Yes / No

**FAIRFAX COUNTY PARK AUTHORITY
MAINTENANCE MANAGEMENT SYSTEM INVENTORY FORM**

-2-

TRAILS – ASPHALT

Length: _____ (feet)
Lights: Yes / No

TRAILS – WOODCHIP

Length: _____ (feet)
Lights: Yes / No

GARDEN PLOTS

No. of Plots _____
No. of Acres _____

FENCING

Type _____
(chain link, split rail, etc.)
Length _____ (feet)

BRIDGES

Type _____

FRISBEE GOLF COURSE

Length of Course _____ (feet)
No. of Goals _____

Notes or Comments:

TRAILS – GRAVEL

Length: _____ (feet)
Lights: Yes / No

TRAILS – NATURAL

Length: _____ (feet)
Lights: Yes / No

SIGNS

No. of Signs _____
No. of Maintained Signs _____

GATES

Type _____
(chain link, wood, etc.)
No. of Gates _____

HORSESHOE PITS

No. of Pits _____

OTHER

2. A written Routine Maintenance Plan

- Maintenance standards for all areas, facilities, equipment in inventory.
- Identification of specific routine maintenance tasks.
- Procedures describing the most efficient methods to accomplish maintenance tasks.
- Frequency of maintenance tasks.
- Personnel necessary to accomplish tasks.
- Material and consumable supplies necessary for each task.
- Tools and equipment required to accomplish each task.
- Accurate time estimates for each task.

3. Procedure for Nonroutine, nonrecurring Maintenance Work

- Examples:
 - Replace broken windows, door hinges, locks, etc.
 - Replace section of golf course irrigation pipe.
 - Set up and removal of chairs for band concert.
 - Temporary mounting of lighting for band concert.
 - Installation of temporary sound system for Fourth of July celebration.

4. Develop a Preventive Maintenance System

- What is preventive maintenance?
 - “Scheduled servicing; repairs; inspections; adjustments; and replacement of parts that result in fewer breakdowns and fewer premature replacement that achieve the expected life of facilities and equipment.” (National Park Service)

5. Assigning Responsibility

- Methods:
 - Unit Maintenance
 - Specialized Maintenance Crews
 - Maintenance by Contract
- Unit Maintenance
 - Each park and recreation facility has its own maintenance personnel.

- Advantages:
 - Personnel become familiar with facility
 - Easy to determine responsibility when work is not properly performed.
 - Maintenance personnel tend to take pride in their work.
- Disadvantages:
 - Personnel must learn to perform many jobs with various equipment
 - Facility supervisor must be familiar with all jobs and equipment
 - Does not make efficient use of expensive equipment.
- Specialized Maintenance Crews
 - Specialized crews move from one park site to another.
- Advantages:
 - The crew becomes very proficient in their specialized work.
 - Expensive equipment is used regularly, which helps justify the purchase of expensive, specialized equipment.
- Disadvantages:
 - The repetition of the work tends to make it monotonous.
 - Loss of time due to travel from site to site.

Note: This system works well when the required skill is difficult to learn, when specialized equipment is needed, or when a number of small facilities are involved.

- Maintenance by Contract
 - Pay an outside contractor to perform maintenance.
- Advantages
 - There is no financial investment in equipment
 - Well-trained specialists can be employed for each job
 - There are no “in house” personnel issues to deal with
- Disadvantages
 - There may be some loss of control as to when and how well the work will be completed.

- The cost may be higher because the contractor must make a profit.

Notes:

- *It is possible to contract for all maintenance work.*
- Maintenance by contract works well in remote areas where travel time is excessive, with jobs that require specialized equipment and trained operators, and when the job is not done routinely.
- Guidelines in Contracting Maintenance Work
- Choose reputable firms.
- Develop detailed specifications
- Inspect contractor's work

6. Scheduling Maintenance Work

- Prioritizing Work
 - Emergencies – Safety hazards, conditions that will disrupt recreation programs, etc.
 - Routine – Not emergencies. Schedule on first-come, first-served basis.
 - Standing – Jobs that can be performed as time permits.
- Considerations:
 - Visitor Use
 - Personnel Capabilities
 - Labor availability
 - Season of the year
 - Availability of materials

7. Cost Analysis and Controls

- Principles:
 1. Maintenance labor and supervision must be related to quantity of measured work.
 2. Responsibility for each expense must be assigned to a specific person.
- Cost Accounting
- Cost Record Systems
- Documenting Maintenance Costs
- Unit Costs and Standardization

Chapter 3

Technology in Park Maintenance

Suggested Discussion/Test Questions

1. Describe the Total Cost of Ownership process for software/hardware selection.
2. List readily available, off-the-shelf software and how they can be utilized in park maintenance operations.
3. Describe a Geographic Information System (GIS).
4. What benefits does a GIS provide park maintenance operations?
5. List the core features of a Computerized Maintenance Management System.
6. Describe the Asset Management model of a Computerized Maintenance Management System.
7. Describe predictive maintenance.
8. Define “right-sizing” for vehicle maintenance.
9. How can the Internet assist a park maintenance operations manager address a problem?
10. Including automatic data collection technologies listed in this chapter, what other emerging technologies may have value for park maintenance operations and how?

Chapter Outline (corresponds with power point presentation)

- **Software and Hardware**
- **Core Government Applications**
- **Specialized Software Applications**
- **Internet**
- **Emerging Technologies**
- **Software and Hardware Decisions**

Selection Process:

- **Ideal** - select software first based upon functionality and need
- **Reality** - hardware already in place, dictates software choice
- **Total Cost of Ownership**
 - **Areas Evaluated:**
 - Initial purchase of hardware (or lease/license of software)
 - Costs for training
 - Costs for upgrades to maintain compatibility
 - Costs of IT support staff to keep system functioning
 - Costs of connectivity to existing topology or required upgrades
 - Costs of ongoing technical support

Off-the-Shelf Software

- Word Processor
 - Remains valuable for document management
 - Forms, letters, reports, etc.
- Spreadsheet
 - Analytics and computation
 - Forecasting, planning, optimization
 - See example next screen
- Database
 - Powerful data management “engine”
 - Relational (ability to connect information across multiple databases inside an organization
 - Strength behind/underneath enterprise-wide software
 - Queries, data analysis, report generation

Core Government Software Applications

- Geographic Information Systems (GIS)
- Global Positioning System (GPS)
- Computer-Aided Design and Drafting (CADD)

Geographic Information Systems

- Organized system of hardware, software, geographic data and people to “manage” geographically referenced information.
- Functions:
 - Measure - how much exists?
 - Map - where is it in relation to something similar or something different?
 - Manage - how can it be accessed?
 - Model - what if this happens?
 - Monitor - has there been any change?

Global Positioning Systems

- Radio-based navigation system based upon 24 satellites and their ground stations
- Extreme accuracy for measuring location (as well as velocity and time)

- Valuable for establishing location relationship (topology) to other items especially when combined with a GIS

Computer-Aided design and Drafting

- Automation of drafting functions for architects and engineers
- Ability to reproduce accurate, easy-to-read drawings
- Storage of digital as-built plans for future use
- Can be integrated into/with a GIS

Specialized Software Applications

- Computerized Maintenance Management Systems
- Project Management
- Fleet Maintenance
- Facility Maintenance
- Energy Management

Computerized Maintenance Management Systems (CMMS)

- Two fundamental software designs
 - Relational database powered preventative maintenance model
 - Asset management (process of maintaining, upgrading and operating physical assets cost effectively) systems based upon significant changes in governmental accounting procedures, GASB 34

CMMS

- New CMMS offer blend of preventative maintenance and asset management models
- Deployment
 - Desktop
 - Single license for small agencies
 - Enterprise-wide (client-server) across local or wide area networks
 - Often may interface with other enterprise-wide systems, accounting, payroll, purchasing, etc.
 - Web-based
 - Application service provider (ASP)
 - Holds data and facilitates usage via subscription fee or license

- Client hosted
 - Allows agency to hold its own data and utilize resources in place

CMMS

- Core feature availability (may be add-ons)
 - Work orders
 - Work requests
 - Preventative maintenance scheduling
 - Equipment
 - Task procedures
 - Locations
 - Purchasing
 - Receiving
 - Labor or workforce
 - Reporting
 - Administration
- Additional value functionality
 - GIS integration/interoperability
 - GPS integration
 - Mobile computing integration
 - Utilization of emerging communication technologies, paging, cell, wireless, bluetooth, etc.

CMMS

- Key benefits
 - Allows for development of agency specific performance standards
 - Identify sectors of high and low productivity
 - Allows managers to relate budgetary constraints to levels of service
 - Allows managers to predict and plan for park maintenance needs of future facilities

Project Management

- Allows for listing, sequencing and tracking of key activities associated with successful and timely completion of projects
- May be based upon well documented techniques, Program Evaluation and Review Technique (PERT)

- May be integrated into GIS or CADD

Fleet Maintenance

- Preventative Maintenance Scheduling
 - Track preventative maintenance needs of all vehicles
 - Assists with fleet maintenance budget management
- Energy Consumption and Management
 - Tracks fuel (diesel, gas, biodiesel, ethanol, etc.) usage by individual vehicle, vehicle class, equipment class
 - Assists with balancing budget resources against rising fuel costs
- Vehicle and Equipment Replacement Schedules
 - Tracks life cycle of vehicles and equipment
 - Assists with budgeting for vehicle/equipment replacement
 - Combined with Preventative Maintenance and energy Consumption may serve as basis for “right-sizing”
 - Right-sizing is an emerging best management practice for purchasing best vehicle/equipment based upon required task, fuel efficiency, horsepower, maintenance costs, etc.

Facility Maintenance

- Focus on major systems
 - Heating, ventilation and air conditioning (HVAC)
 - Electrical
 - Plumbing
- Similar to preventative maintenance plans but based upon predictive maintenance model
 - Predictive maintenance relates to assessing equipment or systems in order to determine their potential to fail during some future point in time
 - Maintenance activity occurs to avoid or mitigate failure
 - Often based upon manufacturer provided metric, for example hours of use
 - Becoming more integrated with emerging automatic data collection technologies such as telemetry

Energy Management

- Utilized in response to growing concerns with energy efficiency, green infrastructure and cost containment
- Designed to control HVAC, lighting and electrical systems
- May have significant up-front costs, but over time often recover costs through energy savings
- Integrate existing and emerging communication technologies for monitoring and control

Internet

- Convergence of technologies for information access
 - World Wide Web
 - Email
 - Instant Messaging
 - Application delivery
 - Imagine the possibilities!!!

Emerging Technologies:

Automatic Data Collection

- Applications to Park Maintenance Operations
 - Bar coding
 - Inventory control
 - Touch (contact) memory
 - Predictive maintenance of systems, HVAC, etc.
 - Magnetic card swipe
 - Payroll, equipment check out
 - Smart cards
 - Personnel data storage, security access
 - Radio frequency identification
 - Vehicle/equipment tracking
 - Global system for mobile communication
 - Remote monitoring of systems

Chapter 4

Managing Maintenance Personnel

Suggested Discussion/Test Questions

1. What approaches might be helpful for recruiting capable skilled maintenance workers for the park and recreation maintenance program?
2. What is “motivation?”
3. Money has been identified as a temporary motivator. Identify and describe sound techniques or methods that have potential as permanent motivators.
4. As a supervisor, how would you attempt to motivate each employee in your work group?
5. What single leadership style is best for motivating all employees?
6. Identify the advantages of interpersonal communication between supervisor and employee compared to written organizational communication from management to employee.
7. Employee orientation should include certain elements. What are these elements?
8. What are the basic principles of learning upon which a job trainer can rely?
9. Describe the relative effectiveness of “telling” and “showing” and the “combination of telling and showing” on the human reception and retention of information.
10. Describe the four-step pattern of instruction developed by industry during World War II.
11. As a supplement to training, explain the utility of maintenance operation manuals.
12. Describe the approach that a supervisor might use in properly handling an employee grievance.
13. Describe the proper supervisory steps to be taken when reprimanding an employee and the criteria to determine whether or not to transfer the reprimanded worker.

Chapter Outline (corresponds with power point presentation)

Managing Maintenance Personnel

- Human Resources Management
- Recruiting Maintenance Personnel
- Understanding and Motivating Employees
- Supervisory Communications
- Personnel Training
- Evaluating Employee Performance
- Legal Issues of Supervision

Human Resources Management

- What is Human Resources Management?

- Employee Handbooks
- Job Descriptions

Recruiting Maintenance Personnel

- Recruiting Strategies
 1. Promote from within
 2. Ask employees for recommendations
 3. Armed forces
 4. Construction industry
 5. Farmers
 6. Develop apprenticeship program
 7. Park and recreation graduates (gain experience)
 8. Technical colleges or trade high schools

Understanding Personnel

- Motivating Employees
 - Worker Retention
 - Realistic Job Previews (RJPs)
 - Pre-Employment Screenings (PES)
 - Motivational Techniques

Supervisory Communications

- Communication Tools
- Job Instruction

Personnel Training

- Orientation
- Employee knowledge and skills
- Basic Learning Principles:
 - From simple to complex
 - Based on what is known
 - Repetition
 - Learning must be used
 - Experience Success
 - Change bad habits
 - Learning is based on experience
 - People learn at different rates
 - People learn in different ways

Training Opportunities

- A few suggestions:
 - Equipment Manufacturers
 - State Cooperative Extension Service
 - Maintenance Management School
 - State Professional Associations

Evaluating Employee Performance

- Why Evaluate?
- Evaluation Systems
 - Rating Scales
 - Performance Appraisal Process
 - Employee Involvement
 - Typical Rating Errors
 - Employee Discipline
 - Labor Relations

Legal Issues of Supervision

- Federal Laws:
 - U.S. Constitution
 - Civil Rights Act of 1964
 - Age Discrimination
 - Americans with Disabilities Act (ADA)
 - Occupational Safety and Health Act (OSHA)
 - Fair Labor Standards Act
 - Equal Pay Act
 - Family and Medical Leave Act
 - Drug Free Workplace
- Legal Issues
 - Hiring Issues
 - Stages:
 - Needs?
 - Develop Job Description
 - Advertise Job
 - Avoid Discrimination
 - Interview Questions
 - Avoid questions about...

- Race
- Age
- National Origin
- Religion
- Politics
- Domestic or Personal Issues
- Gender

10 Rules of Legal Employment Laws (Frances Lynch)

1. Treat all individuals with respect
2. Treat employees equitably
3. Apply the reasonable person standard
4. Observe other employment laws
5. Maintain excellent personnel files
6. Insist your employees follow rules
7. Develop a plan of action
8. Inform your employees
9. When in doubt, consult an attorney
10. Always follow the rules

Chapter 5

Employee Safety

Suggested Discussion/Test Questions

Chapter Outline (Corresponds with power point presentation)

Employee Safety

- Employee Accidents
- Occupational Safety and Health Act (OSHA)
- Employee Safety Training
- Steps to Employee Safety
- Park and Recreation Maintenance Employee Safety Problems

Employee Accidents

- Safety Issues in Park and Recreation Maintenance Management
- Trends in Workplace Safety

The Occupational Safety and Health Act

- What is OSHA?
- Who Does OSHA Cover?
- Complying with OSHA Regulations
- Employer Responsibilities
- Employee Responsibilities
- OSHA Standards
- The OSHA Inspection Process
- OSHA Violations

Employee Safety Training

- Major Causes of Accidents
 - Unsafe Acts
 - Unsafe Conditions
- Techniques for Safe Working Environments
 - Job Safety Analysis (JSA)
 - Job Instruction Training (JIT)

Job Instruction Training (JIT)

- What is JIT?
- Qualifications of Job Instruction Trainers:
 - Know the job thoroughly
 - Leadership skills
 - Enjoy teaching others
 - Respected by other employees
 - Professional attitude

4-Point Method of Job Instruction Training

1. Preparation
 - a) Put employees at ease
 - b) Define the job
 - c) Develop interest
 - d) Correct instructional position
2. Presentation
 - a) Tell, show and illustrate one step at a time
 - b) Stress each key point
3. Application
 - a) Have employee perform job
 - b) Have employee explain each key point
 - c) Make sure the worker understands each step
 - d) Continue until you are sure workers fully understand
4. Testing – Follow-up
 - a) Let the employee work on the operation
 - b) Designate a person to go for assistance
 - c) Check frequently
 - d) Taper off instruction

Steps to Safety

- First, managers must understand...
 - Accidents can be prevented
 - Accident prevention costs less than the costs of accidents
 - Safety is good management

7 Steps to Starting an Employee Safety Program

1. Be enthusiastic in starting safety program

2. Assign someone to help with details
3. Locate hazards
4. Make the job safe
5. Control employee work habits
6. Keep safety records
7. Get employees into the act

Typical Park and Recreation Maintenance Safety Problems

- Temporary and Seasonal Employees
- Language Barriers
- Workers in Isolated Locations
- Vehicles and Traffic Hazards
- Tools and Equipment
- Protective Equipment
- Trash Removal
- Mowing Operations
- Landscaping

Chapter 6

Maintenance of Buildings and Structures

Suggested Discussion/Test Questions

1. Describe the basic corps of workers necessary for structural and building maintenance.
2. Indicate the basic elements involved in a preventive building maintenance program.
3. Describe a satisfactory method for scheduling the infrequent but routine preventive maintenance jobs.
4. What criteria should be considered when determining the feasibility of purchasing various building maintenance equipment.
5. Describe building custodial cleaning standards and how they are developed.
6. Outline the three methods of determining building custodian staffing requirements.
7. Discuss the advantages and disadvantages of individual and crew custodial cleaning.
8. In what ways does building design relate to building “cleanability?”
9. Describe the recommended features that should be included in a building custodial closet.
10. Cite the advantages and disadvantages of contract building cleaning.
11. What investigative steps should a maintenance manager take in the event that an unusually low bid for janitorial work is received from an unfamiliar contractor?
12. What should be included in written contract specifications for contract janitorial services?

Chapter Outline (Corresponds with power point presentation)

Maintenance of Buildings and Structures

- Technology Applications
- Organization and Staffing
- Building Maintenance Standards
- Preventive Maintenance
- Equipment and Supplies
- Custodial or Housekeeping Services
- Labor-Saving Designs and Practices
- Contract Cleaning

Technology Applications

- Security Systems
- Software Systems

- Record Keeping
- Work Orders
- Inventory Supplies
- Billings
- Preventive Maintenance Scheduling

Organization and Staffing

- Staff Size
- Basic Staffing Needs for Small Park and Recreation Agency:
 - Carpenter
 - Electrician
 - Mechanic
 - Painter

Building Maintenance Standards

- Goal: *...to ensure maximum, overall economy for its functional requirements.*

Preventive Maintenance

- Goal: *...to minimize emergency repairs*
- Includes:
 - Building Surfaces
 - Doors
 - Drains
 - Exhaust Fans
 - Fan Belts
 - Faucets
 - Filters
 - Light Fixtures
 - Light Bulbs
 - Mechanical Rooms
 - Motors
 - Pumps
 - Shower Valves
 - Toilets

Preventive Maintenance Job Inventory

- Steps:
 1. Inventory of all items requiring service during the year.
 2. Determine type of service, frequency, and cost of each, and who should do the work.
 3. Schedule the work throughout the year.
 4. Control and revise as needed.

Scheduling Preventive Maintenance Work

- Challenge: scheduling tasks into daily, weekly routines.

- Use equipment manuals for guidelines
- Typical preventive maintenance tasks:
 - Daily Tasks: inspect plumbing for leaks
 - Weekly Tasks: inspect fan belts for wear
 - Monthly Tasks: Clean or replace HVAC filters (Heating, Ventilation, Air Conditioning)
 - Quarterly: Lubricate mechanical equipment per manual
 - Annual: Fire Extinguishers – Repair, recharge, or replace

Preventive Maintenance Personnel

- Expertise in:
 - Analyzing equipment breakdowns
 - Estimating work (time and costs)
 - Coping with emergencies
 - Understanding of electrical and mechanical equipment
- Other Traits:
 - Initiative
 - Ability to work independently
 - Know their abilities and limitations

Assigning Preventive Maintenance Work

- Two Common Methods
 1. Area Maintenance
 - Responsible for clearly defined area
 2. Crew Maintenance
 - Maintenance crew covers numerous facilities

Area Maintenance

- Advantages:
 - More thorough
 - On-spot repairs
 - Know what to expect
 - Encourages pride in condition of buildings
- Disadvantages:
 - Limited to fairly simple tasks
 - Works alone
 - Limited to work that one person can perform.

Crew Maintenance

- Advantages:
 - Crew covers larger zone
 - Flexibility allows crew to complete more jobs
 - Number of staff sent to job varies according to complexity
 - Crew members cover for each other when one is absent
- Disadvantages:
 - Don't get to know facilities as well
 - Difficult to determine poor employee performance
 - Difficult to assign best number of employees

Building Maintenance Equipment

- Criteria for Purchasing Equipment
 - Competent personnel
 - Frequency of use
 - Replacement of parts and repairs
 - Storage space
 - Versatility
 - Size
 - Standardization

Custodial or Housekeeping Services

- Cleaning Standards
- Examples:
 - Daily Work:
 - Vacuum traffic areas, clean restrooms, etc.
 - Weekly Work:
 - Damp mop floors, sweep stairwells, etc.
 - Monthly Work:
 - Machine scrub and wax floors, etc.
 - Annual Work:
 - Clean fluorescent light fixtures, etc.

Time Required for Cleaning Levels

(Example)

TABLE 6.1 Achievement levels of cleaning for major areas in a Hypothetical recreation center building

Area	Excellent	Good	Fair
Office	12 minutes	10 minutes	8 minutes
Gymnasium	25	20	15
Shower & Locker Room	30	25	20
Lounge	20	15	10
Meeting Room	17	15	10
Small Library	21	15	10
Bathroom Fixtures	23	20	20
Equipment & Supply Room (150 s.f.)	7	5	3

Benchmarking Building Maintenance

- Seeks and describes best examples of performance to establish standards of quality.
- Goal: *...to identify deficiencies and to implement plans to reach or exceed defined level of performance.*

Typical Building Maintenance Tasks for Benchmarking

- Size of facility
- Maintenance budget
- Number of maintenance employees
- Size of area per custodial employee
- Ratio of workers to supervisors
- Budget for contract services
- Custodial costs per square foot
- Staff training availability
- Labor hours for standard tasks
- Administrative labor costs
- Ratio of workers to users

Custodial Staffing

- 3 Methods to Determine Staffing Levels:
 1. Square Footage
 2. Typical Area Measurement
 3. Time and Motion Studies

Staffing by Square Footage

- Example:
 - 1 staff person for 15,000 S.F. of building to maintain
- Advantage:
 - Easy to calculate

- Disadvantage:
 - Lack of accuracy

Staffing by Typical Area Measurement

- Six Steps:
 1. Identify types of spaces in all buildings
 2. Time several custodians and observe cleaning methods
 3. Average all times for like areas
 4. Calculate workload for each floor
 5. Add all times together. Divide by minutes each custodian works per day to get required staffing.
 6. Classify positions and multiply by pay levels to get total budget needed.

Staffing by Time and Motion Study

- Requires total inventory of all buildings, rooms, furniture, furnishings, etc.
- Supervisors determine average cleaning time for each task by...
 - Observing employees performing tasks, or...
 - From facility management professional organizations.
- Multiply frequency for each task by average cleaning time
- Add results to get total number of worker hours required

Assigning Custodial Work

- Methods:
 1. Individual Cleaning
 2. Crew Cleaning

Individual Cleaning

- Advantages:
 1. Pride of achievement
 2. Less monotony
 3. Improved morale
 4. Responsibility for poor work can be identified
 5. Easy to schedule around users

Crew Cleaning

- Advantages:

1. Staff specialization leads to efficiency
2. Increased morale due to presence of other workers
3. Need less custodial equipment
4. Workloads can be evenly distributed
5. Absences cause fewer disruptions

Labor-Saving Designs and Practices

- Building Design
 - Encourage easy-to-clean design and construction materials
 - Review plans as they develop.
 - Develop check-list of materials, design features, custodial facilities, etc.

Examples of Building Design for Cleanability

- Floors
 - Avoid hand cleaning
 - Floor drains in restrooms
- Walls
 - Use durable and washable materials and coatings
- Entranceways
 - Hard surfaces
 - Well drained
 - Rugs at entrances
 - Aluminum door and window frames
- Furnishings and Equipment
 - Soap dispensers, etc. should last full day
 - Hang bathroom fixtures on wall for floor access
- Custodial Facilities
 - Provide hot and cold water and electrical outlets
 - Adequate custodial closets
 - Standardize storage of cleaning tools and supplies

Contract Cleaning

- Services provided by contractor

	Risks	Benefits
Contracting	Loss of control. Cost escalation over time. Performance degradation over time. Inability to reinternalize key processes.	Cost reductions. Leverage of high-cost staff. Some transfer of risk to vendor.
In-House	Requires significant management involvement and commitment. May require investment in Training, systems, inc. Change imperative must be clear and convincing.	Control is retained while service is improved. Cost reductions, short-term and long-term.

Figure 6.6 Contracting vs. In-House Risks and Benefits
 (Adapted from Cost Planning & Estimating for Facilities Maintenance.
 R.S. Means, 1996, P. 51.)

Chapter 7

General Outdoor Maintenance

Suggested Discussion/Test Questions

1. Describe the solid waste problem in the United States?
2. What can park administrators do to help solve litter problems in areas under their jurisdiction?
3. How do you determine what type of trash receptacle is best for use in park and recreation areas?
4. What type of vehicle should be used to pick up trash and litter?
5. What are the acceptable methods of solid waste disposal?
6. How do you determine which is the best sewage disposal system for a park?
7. How can a water system for a rural park be provided?
8. Describe the characteristics of an ideal recreation surface material.
9. When is it good practice to add night lighting to recreation facilities?
10. Why should night lighting for recreation facilities be considered?
11. What is meant by "luminaries?"
12. What is the unit for measuring quality of light on playing surfaces?
13. What characteristics determine the best type of fencing to be used in park and recreation areas?
14. What is the purpose of signs in park and recreation areas?
15. What are the benefits of using international sign symbols in park and recreation areas?
16. What factors should be considered when developing a sign system for park and recreation facilities?
17. What factors should be considered when developing a good trail or greenway system?
18. What are some of the potential benefits of greenways?
19. Identify and describe techniques for controlling erosion.

Chapter Outline (Corresponds with power point presentation)

General Outdoor Maintenance

- Solid Waste
- Sewage and Water Systems
- Outdoor Lighting
- Fencing
- Signs
- Outdoor Surfaces
- Roads, Parking Lots
- Trails

Solid Waste

- Litter Control
 - Public Education
- Trash Control
 - Trash Receptacles Selection
 - Function
 - Aesthetics
 - Easy to Handle
 - Secure Fitting Cover
 - Easy to Clean
- Waste Collection
 - Collection Vehicle Selection
 - Amount of material to be collected
 - Loading height of vehicle
 - Blowing trash
 - Durability
 - Ease of Loading
- Incineration
- Recycling
- Bulk Collection

Sewage Disposal Systems

- Pit and Chemical Toilets
- Composting Toilets
- Septic Tanks
- Lagoons
- Aerobic Digestion
- Disposal System Selection
- Consider the following...
 - Public health requirements
 - Quantity of sewage to be treated
 - Construction – Installation costs
 - Maintenance requirements
 - Land area available
 - Soil characteristics
 - Water table level
 - Water course presence

Water Systems

- Potential Sources
 - Community water systems
 - Wells
 - Impure water supply

Night Lighting

- Lighting Basics
 - Lighting
 - Lumen
 - Footcandle
 - Initial Footcandles
 - Constant Light Levels
 - Uniformity
 - Photometrics
 - High intensity Discharge Lamp (HID)
 - Light Loss Factor
 - Point-by-Point

Quantity of Light

- Sport type
 - Players' skill level
 - Field size
 - Spectator capacity
 - TV/Video requirements

Quality of Light

- Sky glow
- Spill light
- Glare

Lighting Structures

- Components
- Luminaire assemblies
- Poles

Fencing

- Considerations in selecting fencing:
 - Function
 - Cost of installation

- Durability
- Maintenance cost
- Aesthetics
- Safety

Types of Fencing

- Post and rail
- Chain link
- Woven wire
- Post and board
- Solid board

Signs

- Types:
 - Routed
 - Sandblasted
 - Raised letter
 - Painted or silk screened

International Sign Symbols

Wood Preservation

- Why important?
- Options:
 - Creosote treated
 - Penta (pentachlorophenol) treated
 - Select woods with decay-resistant qualities:
 - Cedar
 - Redwood
 - Locust

Outdoor Recreation Surfaces

- Qualities of the Perfect Surface:

<ul style="list-style-type: none"> ○ Multiple use ○ Dustless and stainless ○ Durable ○ Installation cost ○ Maintenance needs 	<ul style="list-style-type: none"> ○ Maintenance costs ○ Pleasing appearance ○ Nonabrasive ○ Resilient ○ Year-round use ○ Not slippery
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- Access for those with disabilities

Types of Outdoor Surface Materials

- Natural earth
- Turf
- Aggregates
- Concrete
- Bituminous
- Synthetic

Play Area Surfacing

- Purpose – Reduce severity of injuries due to falls
- Options:
 - Wood fiber mulch
 - Sand
 - Pea Gravel
 - Rubber

Roads and Parking Lots

- Primary Options:
 - Asphalt (bituminous)
 - Concrete
 - Gravel
 - Geotextile base

Trails and Greenways

- Potential Benefits of Greenways
 - Helps control soil erosion, siltation
 - Wildlife habitat
 - Thoroughfare for walkers and bicyclists
 - Improves air quality
 - Reduces noise
 - Buffers land uses
 - Recreation
 - Preserves natural environment
 - Preserves cultural and historical areas
 - Economic benefits

Trail Design and Maintenance

- Dimensions
- Surface (tread)
- Trail layout
- Trail markings
- Maintenance

Soil Erosion

- Types
 - Sheet Erosion
 - Gully Erosion

Erosion Control

- Goal: slow water movement
- Techniques:
 - Vegetation
 - Terracing
 - Mulch
 - Diversion ditches
 - Check dams
 - Water bars

Chapter 8

Grounds Maintenance

Suggested Discussion/Test Questions

1. Describe the best soil conditions for growing turfgrass.
2. How do you prepare soil for planting turf areas?
3. Why, how, and when should you aerate soil?
4. Describe the importance of nutrient elements in the care of turfgrass.
5. What kinds of irrigation systems can be used for turf areas?
6. Describe the methods of establishing turfgrass.
7. How do you determine what variety of turfgrass is best for a particular park and recreation area?
8. What are some of the problems that make care of a golf course more complex than general lawn care?
9. Why do some park and recreation agencies classify various levels of athletic fields?
10. What is the value of landscaping park and recreation areas?
11. Identify some of the benefits of trees and shrubs.
12. How do you determine what plants are best for park plantings?
13. What must be done to properly care for shrubbery?
14. Should a park and recreation department develop its own plant nursery?
15. What are the current park practices with regard to urban forestry?
16. What are some of the problems and possible solutions commonly found in managing urban trees?

Chapter Outline (Corresponds with power point presentation)

- **General Turf Management**
- **Turfgrass**
- **Specialized Turf Areas**
- **Athletic Fields**
- **Turf Management and Technology**
- **Trees and Shrubs**
- **Urban Forestry**

General Turf Management

- **5 Essential Elements to Turf Care:**
 1. **Soil**
 2. **Grass**
 3. **Water**
 4. **Air**
 5. **Sunlight**

Soil

- **Ingredients:**
 - Mineral particles (sand, silt, clay)
 - Organic Matter (humus)
 - Living plants and animals
 - Air
 - Water

- **Soil Preparation, including:**
 1. Test soil pH and nutrient content
 2. Grade area
 3. Remove undesirable plants
 4. Add lime
 5. Plow area
 6. Add soil conditioners, nutrients as needed
 7. Rototill
 8. Smooth surface
 9. Plant grass
 10. Roll
 11. Mulch
 12. Water
 13. Top dress with fertilizer
 14. Mow

Soil Nutrients

- **3 Major Nutrients Needed for Healthy Turfgrass**
 1. Nitrogen – promotes leaf growth
 2. Phosphorus – promotes root growth
 3. Potassium – strengthens grass and provides resistance to disease

Turfgrass Selection

- **Cool-Season Grasses**
 - Fescue
 - Kentucky Bluegrass
 - Bentgrass
 - Ryegrass
- **Warm-Season Grasses**
 - Bermuda

- Zoysia
- Carpetgrass
- St. Augustine
- Centipedegrass
- Bahiagrass

Planting Turfgrass

- 4 Methods:
 1. Seeding
 2. Vegetative Propagation
 3. Plugging
 4. Sodding

Specialized Turf Areas

- Golf Courses
- Athletic Fields

Athletic Field Turf Classifications

(Example)

- Level I – League play and tournaments. These have a high visitation and should be maintained at the highest level of maintenance for Park Authority fields. These fields are used for tournament and league play only. No pick-up games allowed.
- Level II – League Play and tournaments. These fields have a moderate to high visitation and should be maintained at a high level of maintenance. These fields are used for tournaments, league play and pick-up games are allowed when they don't interfere with scheduled games or maintenance. Fields receive maintenance Monday through Friday.
- Level III – League Play. These fields have moderate to high visitation, have league play and should be maintained at a high level of maintenance. Pick-up games are allowed when they don't interfere with scheduled games or maintenance.
- Level IV – Neighborhood Fields. Have low to moderate visitation and should be maintained at a moderate level of maintenance. Neighborhood use only; no leagues or tournaments.

Technology and Turf Management

1. Scheduling fertilization, seeding, aeration, irrigation
2. New turfgrass varieties
3. Ground protection materials (geotextiles)
4. Equipment

5. Slow release fertilizers, chemicals
6. Research

Trees and Shrubs

- Benefits:
 - Aesthetics
 - Reclamation
 - Climate Control
 - Windbreaks
 - Cooling
 - Reduce Air Pollution
 - Control Soil Erosion
 - Reduce Noise
 - Control Pedestrian
 - Screen Unattractive Areas
 - Wildlife protection and Food

Urban Forestry

(Street trees, trees on residential property, park and greenway trees.)

- Functions:
 - Planting
 - Maintenance
 - Removal

Potential Problems With Urban Trees

- Create blind intersections
 - Solution – remove and replace with smaller trees and shrubs
- Tall trees block street lights and stop lights
 - Solution – select smaller trees
- Root damage to sidewalks
 - Solution – don't plant in sidewalk/street strip
- Trees grow into utility lines
 - Solution – Select low growing trees
 - Crape myrtle
 - Dogwood
 - Japanese maple
 - Redbud

- Etc.

Tree Planting and Maintenance

- Tree Removal
- Why?
 - Dead or diseased
 - Hazard due to size

Park System Nurseries

- Considerations:
 - Volume of plants needed
 - Commercial plant sources
 - Land availability
 - Funds
 - Qualified personnel

Resources for information on trees, shrubs, turf, flowers, etc.:

- State Cooperative Extension Service
- State Forestry Division
- Seed and Plant Vendors
- International Society of Arboriculture

Chapter 9

Maintenance Equipment

Suggested Discussion/Test Questions

1. Describe the four different types of equipment that can be used for mowing turf areas. Why would each be selected?
2. What factors must be considered when selecting maintenance equipment?
3. What is involved in caring for the equipment that is owned by a park and recreation department?
4. What records should be kept for maintenance equipment?
5. Why are maintenance equipment records important?
6. Should a park and recreation department maintain its own garage?
7. What is the function of a maintenance service center?
8. What buildings and equipment would you expect to find in a well-equipped maintenance service center?
9. Identify the various types of communication systems commonly used in park and recreation settings. What are the advantages of each?
10. What energy conservation measures can your local park and recreation agency put into effect to lower energy costs?
11. In what ways can facility and site planning considerations help reduce energy consumption?

Chapter Outline (Corresponds with power point presentation)

Maintenance Equipment

- Survey of Equipment
- Care and Maintenance of Equipment
- Equipment Replacement
- Equipment Records
- Communication Systems
- Energy Conservation

Survey of Equipment

- Selection of Maintenance Equipment
- Questions to answer:
 - Speed requirements?
 - Experience level of drivers
 - Purpose of vehicle?
 - Type of terrain?
 - Maximum load capacity?
 - Pull implements?

Mowing Equipment

- Types of Mowers:
 - Rotary
 - Reel
 - Flail
 - Sickle Bar

Turf Maintenance Equipment

- Examples:
 - Aerifier
 - Spiker
 - Renovator
 - Rollers
 - Sod Cutters
 - Seeders
 - Hydroseeders
 - Etc.

Selecting Maintenance Equipment

- Selection Criteria:
 - Function
 - Quality
 - Availability of Parts and Service
 - Fuel Economy
 - Safety
 - Standardization
 - Maintenance
 - Cost

Equipment Care and Maintenance

- Preventive Maintenance
- Equipment Repair

Equipment Replacement

- Funding Equipment Replacement
 - Methods:
 - Funds earmarked in annual budget
 - Separate supplementary budget
 - Separate maintenance fund budget

Equipment Records

- Two Types:
 - Inventory Records
 - Operational Records

Maintenance Service Centers

- The Hub of the Maintenance Department
- Functions Provided by Service Center:
 - Central location for routine maintenance operations
 - Major and minor repair work
 - Park construction crew

Development of Maintenance Service Centers

- Considerations:
 - Geographic location
 - Accessibility to utilities
 - Topography
 - Size
 - Aesthetics

Maintenance Service Center Areas

- Workshops – carpentry, electrical, plumbing, etc.
- Garage – vehicle maintenance
- Storage buildings
- Outside storage space
- Fuel storage
- Wash pits
- Facilities for employees

Communication Systems

- Mobile Communications
 - Mobile phone service
 - Two-way radios
 - Paging systems

Equipment Preventive Maintenance

1. Goals:
 - Prevent safety hazards

- Prevent or reduce breakdowns
- Reduce operating costs

Chapter 10

Maintenance and the Public

Suggested Discussion/Test Questions

1. Discuss the incidence of liability lawsuits and recreation maintenance practice.
2. In order to successfully bring a legal liability suit based on negligent conduct, what elements must be proved to recover damages from the wrongdoer?
3. Discuss the current trend relative to governmental immunity.
4. Explain how the legal doctrines of “assumption of risk” and “contributory negligence” are influenced by the age of the plaintiff.
5. Cite specific park and recreation situations in which the legal charge of “nuisance” might be involved.
6. Discuss the current trends of fatalities and injuries to park visitors and recreation participants in the United States.
7. Describe the three major types of fire protection equipment for buildings.
8. Discuss the problem of vandalism in U.S. park and recreation areas. Which of the suggested solutions do you think might work?
9. Indicate the justification and need for “evaluative” vandalism research for parks and recreation areas in the United States.
10. Distinguish between public relations and public relations management.
11. Explain how a recreation maintenance division should be responsive to its public (plural) rather than public (singular).

Chapter Contents (Corresponds with power point presentation)

Maintenance and the Public

12. Public Liability
13. Public Safety
14. Risk Management
15. Vandalism
16. Public Relations

Public Liability

- Tort Liability
 - Negligence
 - Care Owed to Visitors
 - Invitee
 - Licensee
 - Trespasser
 - Doctrine of Attractive Nuisance
 - Doctrine of Governmental Immunity
- Assumption of Risk

- Contributory Negligence
- Statute of Limitations
- Insurance
- Legal Actions and Maintenance
- Preventive Maintenance and Lawsuits

Public Safety

- Dealing with Injuries
 - General Procedures:
 - First aid kits accessible
 - Check contents of first aid kits
 - Have list of physicians
 - Register participants when possible

First Aid Procedures

- Render first aid
- Call ambulance
- Call hospital ahead of arrival
- Call parents or guardian
- Don't cause anxiety
- Have parent transport victim if possible
- Fill out accident report
- Eliminate cause of accident
- Verbal report to manager if serious
- Do not admit fault – inform attorney in writing of injuries
- Show personal interest

Risk Management

- Risk: "...the possibility of suffering harm from a hazard that can cause personal injury, death, property damage, economic loss, or environmental damage."
- 3 Phases:
 - Risk identification and assessment
 - Risk response strategies
 - Management to reduce reoccurrence

Benefits of Risk Management

- Enhances participant experience

- Provides good stewardship of assets
- Helps avoid legal actions
- Encourages professional practices

Risk Management Phases

- Phase I – Risk Identification
- Phase II –Risk Assessment
- Phase III – The Risk Management Plan

Other Accident Prevention Strategies

- Building Plan Review
- Safety Hazard Inspections
 - Fire Protection
 - Review building plan for fire protection
 - Fire hazard survey inspection
 - Fire alarms
 - Sprinkler systems
 - Fire extinguishers

Vandalism

- Causes
- Solutions and Strategies

Vandalism Solutions and Strategies

- Public education
- Staff education
- Participant involvement
- Improved maintenance
- Facility design and construction
- Increased surveillance
- User fees
- Remove opportunity
- Vandalism surcharge
- Membership cards
- Communicate Results

Public Relations Management

- Every Organization has Public Relations
- Multiple Publics

- For Effective Public Relations:
 - Understand various publics
 - Be aware of importance of public information
 - Establish good community relations

Curb Appeal

Customer Service and Quality Assurance

- Service Quality Defined: “The delivery of excellent or superior service related to customer expectations.”
- Maintenance Service Quality
 - Develop maintenance standards
 - Identify customer expectations
 - Seek to exceed those expectations

Minimize User Conflicts

- Examples?
 - Trail users
 - Facility users
 - League play vs. pick-up games
 - Others?
- Goal – Minimize user conflict
- Maintenance Impacts?

User Conflict Management Elements

- Communications
- Design of Facilities
- Planning
- Scheduling
- Maintenance Personnel Training

Suggested Student Assignments and Projects

Exam questions and student assignments recommended by Dr. James Drummond, Chair, Sport and Leisure and Sport Management, Elon University

Exam Questions:

Explain relationships between the term “stewardship” and maintenance management.

Of what value is a written maintenance management plan?

Describe a desirable/necessary association between operations and maintenance in any capital budget request.

Define and directly relate agency mission, goals, objectives, strategies with maintenance management.

Identify and explain common elements contained in a purchase bid procedure.

Why is maintenance often the first item of budget reduction? How may maintenance be best defended in the budget process?

Using your personal or family automobile as example, specifically explain why preventive maintenance is important. Give examples.

Explain with examples how campus maintenance management may be used as a public relations/admissions tool.

Why should all maintenance tasks be accomplished as soon as possible?

Who should write purchase contracts – agencies or contractors? Why?

What relationship should exist between the operations and maintenance divisions? Explain!

List 10 tasks to be performed in establishing turf on a 40 % slope. Explain! (I also use this as an in-class assignment).

Student Assignments:

1. Collect and explain equipment specification sheets.
2. Write an equipment specification sheet.
3. Write a maintenance job description.
4. Write a letter dismissing an employee (or your instructor), then analyze the process!

5. Divide students into groups; tour any building on campus and have each group write one element of a maintenance plan; then bring all student groups together and prepare a complete plan. Discuss and analyze!
6. Bring in one article each week from the current periodical literature related to maintenance and discuss relevance in class.
7. Tour campus and record direct relationships between maintenance management and area and facility design. Discuss in class.
8. Discuss relationship between maintenance management and campus security.
9. Discuss relationship between comprehensive maintenance and safety.
10. Go to the internet and collect 10-20 maintenance job announcements. Analyze.
11. I have just begun this assignment: Write a paper on the relevance of maintenance management in a higher education recreation, park and sport curriculum i.e., why should this course be included?
12. I always tell the following story with critical analysis by students: A park superintendent and a maintenance worker are riding in a state park. There is a state ordinance that all dogs must be on a leash not longer than 10 feet. They encounter a lady walking her dog with no leash. The superintendent approaches her and explains that for the safety of her dog and park visitors, the dog must be leashed. She thanks him and turns to retrieve a leash. The park maintenance man then leans from the window and states "... and keep your d@#\$ dog on a leash...". This is usually good for a 15-20 minute discussion.

This is a major course project for courses that cover the operation and maintenance of recreation and sport facilities as opposed to a stand alone course on maintenance management.

Operation and Maintenance Manual Project Description

Project Overview

This assignment is to develop an Operations and Maintenance Manual for a park, recreation or sport facility. An operations manual is a document used to guide the work of managers and employees of a facility. The contents of an operations manual are on agency policies and procedures, employee responsibilities, operational procedures.

The objectives of this assignment are:

1. To provide the student with practical knowledge of the operation and maintenance of an existing facility.
2. To provide the student with an application for the material covered in class readings and lectures.
3. To provide the student with an in-depth understanding of the detail and diversity of the day-to-day operation and maintenance of a recreation, park or sport facility.

4. To provide the student with an opportunity to demonstrate group leadership and personal responsibility for completion of her/his respective section of the project.

The completed operation/maintenance manual has five sections, each of which is due on different dates during the semester. Each section has a due date. The section will be graded and returned to the student responsible for that assignment with suggestions for improvement. The final operations/maintenance manual will be submitted on _____. Note that this project contributes 100 (of 500) points towards each student's final grade.

This project will be completed in groups of five to six students, with each student having leadership responsibility for a specific section. In some cases 2 students will be given responsibility for one section if it is thought to take more effort than other sections. One team member can be assigned the responsibility of producing the final document from sections prepared by other members of the group. That student should be skilled in computer applications (Word, Excel).

Section I	Introduction and Administration	Due: _____
Section II	Inventory of Facilities and Programs	Due: _____
Section III	Facility Policies and Procedures	Due: _____
Section IV	Risk Management Assessment and Plan	Due: _____
Section V	Maintenance/Operations Plan	Due: _____

Project Logistics

Class members will have the option of selecting from two different facilities:

- _____
- _____

Note: Other sites suggested by groups of students will be considered. They must include indoor and outdoor areas and have recreational or public use as its primary function.

Each team member will have leadership responsibility for a section of the manual, although all team members should be involved in determining the content of each section, as well as approving the section prior to submission. Labs will be scheduled for site visitation and team work on various sections of the manual.

Evaluation

Each student will be evaluated for her/his contribution to each section of the manual as it is developed. Recognizing that it is common for some team members to put more effort into their work than others, all team members will be required to evaluate the work of other team members. Grades will be determined based on the quality of each section submitted, the quality of the final product, and peer evaluations of other team members.

Getting Started

The following steps are recommended in getting started on the project:

1. Carefully review the project requirements.

2. Select the facility of your choice.
3. Determine which section you would like to lead.
4. Establish teams of 5 – 6 students that will develop the operations/maintenance manual.
5. Meet to determine information that should be collected for each section, agree on responsibility for collecting information.
6. Accumulate information on the facility, administrative procedures for the owning agency, historic and current use levels, brochures and flyers, maps, etc.
7. Make a site visit to meet the facility manager, inventory all areas, identify unique or special challenges in managing the facility, etc. NOTE: Make appointments to visit the facility, and always let the managing staff know when you are on site.
8. Complete each section based on the deadlines on page 1.

Contents of Each Section

Contents for each section will vary as a result of the type of facility, ownership, and the availability of information. The following is an overview of the typical contents of each of the five sections of an operations/maintenance manual:

Section I Introduction and Administration

- a. Ownership
- b. History of facility
- c. Mission statement, goals, etc. of owning agency or organization
- d. Budget
- e. Mission statement of facility
- f. Staff organization Chart for agency (positions, not names)
- g. Facility Location map
- h. Location and directions to facility
- i. Staff organizational chart of facility
- j. Facility budget
- k. Names and phone numbers of key organization and facility staff
- l. Job descriptions for all facility staff.

Section II Inventory of Facilities and Programs

- a) Description of land areas (turf, landscaped areas, parking, trails, etc.)
- b) Identification of all major buildings and structures including name and type of structure, size (square footage), construction materials, etc.
- c) Identification of support facilities (separate restrooms, storage buildings, etc.)
- d) Programs and services by season (be specific)

Section III Facility Policies and Procedures

- a) Hours of operation
- b) Chain of command
- c) Dress, uniforms, keys
- d) Smoking policy
- e) Staff rules and regulations

- f) Reservation/booking procedures
- g) Program development responsibilities
- h) Marketing and promotion policies and procedures
- i) Public relations
- j) Customer or citizen relations
- k) Media relations
- l) Forms (appendix)

Section IV Risk Management Assessment and Plan

- a) Health and safety procedures for employees and visitors
- b) Risk management assessment procedures
- c) Vandalism and property damage
- d) Criminal concerns
- e) Inclement weather policy
- f) Emergency procedures
- g) Forms (appendix)

Section V Maintenance/Operations Plan

- a) Description of maintenance tasks and responsibilities (what is done by facility staff, what is done by others, etc.)
- b) Task identification (all major maintenance tasks)
- c) Maintenance standards (quality, frequency, etc.); procedures; staff requirements; necessary skills, abilities, training, certification, etc.
- d) Equipment, tools and supplies required for each task
- e) Scheduling (time required), frequency and time requirements for each task
- f) Evaluation procedures (clear statement of inspections, records kept, etc.)
- g) Work order procedures
- h) Forms (appendix)

Grading		Points
Section I	Introduction and Administration	17
Section II	Inventory of Facilities and Programs	17
Section III	Facility Policies and Procedures	17
Section IV	Risk Management Assessment and Plan	17
Section V	Maintenance/Operations Plan	17
Organization of Final Document		
	Table of Contents	5
	References	5
	<u>Overall organization and appearance</u>	<u>5</u>
Total Points		100

Maintenance Plan Development.

This class project has been adapted from the second-year curriculum of the Park and Recreation Maintenance Management School. See the folder in the CD-Rom titled “*Plan.*” It includes an explanation of the project along with a power point presentation and supporting documents including a park map.

This is an extensive class project that should be conducted over the majority of a class or semester schedule. It is very realistic in nature and will help students in developing a sound understanding of what is involved in the development of a routine maintenance plan for a park and recreation agency. This exercise would also be helpful to park and recreation administrators that do not currently have routine maintenance plans.

The Park and Recreation Maintenance Management School is a two-year professional development program for park and recreation personnel. The school has celebrated over 30 years of service to the Park and Recreation profession. This comprehensive instructional program was the first program in the nation specifically designed for park, recreation and conservation personnel who manage park and recreation maintenance programs. This program is conducted by the Department of Parks, Recreation and Tourism Management and Continuing and Professional Education at North Carolina State University and the National Recreation and Park Association (NRPA). Oglebay Resort in Wheeling, WV has served as the host for the Park and Recreation Maintenance Management School since 1972.

Outdoor Recreation Management Apportionment Strategy.

The CD-Rom accompanying this instructor's manual includes **A Pro-active Outdoor Recreation Management Apportionment Strategy** Excel spreadsheet application (folder labeled "Excel Spreadsheet") designed by Dr. Chrystos Siderelis and Scott Payne. This spreadsheet application has been provided to local government park and recreation departments in North Carolina via NC State University Department of Parks, Recreation and Tourism Management's Recreation Resources Service (RRS). RRS is a technical assistance program offered through a cooperative partnership between the N.C. Division of Parks and Recreation and the N.C. State University Department of Parks, Recreation and Tourism Management.

The spreadsheet has been designed to follow key principles of a park maintenance management plan; task allocation and cost allocation. The apportionment strategy worksheet utilizes the integer goal program for optimal apportionment strategy for park operations referenced in Chapter 3. This spreadsheet may be customized by the instructor to use with the project from the Parks and Recreation Maintenance Management School. The spreadsheet may also be linked/integrated with an ESRI ArcGis exercise.