Manassas City Public Schools

Facilities Maintenance Proposal

MANASSAS CITY PUBLIC SCHOOLS

Where Learning Powers the Future

FY2017 - FY2021

April 12, 2016

The Manassas City Public Schools Support Services Department realizes that an essential component of an effective school system is a well-conceived school facilities maintenance plan. A properly implemented plan provides School administrators comfort and confidence when contemplating the future of their campuses. A comprehensive maintenance program is a schools district's foremost tool for protecting its investment in school facilities.

The objective of the Manassas City Public Schools Facilities Maintenance Plan is to provide a clean, orderly, safe, cost-effective, and instructionally supportive school environment that contributes to the school division's vision that each student will achieve his or her maximum potential as a productive citizen of the 21st century.

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Maintenance Master Plan - 5 Year Forecast

**Dollars in Thousands*

SCHOOL	Project	FY2017*	FY2018*	FY2019	FY2020	FY2021	TOTAL*
	Electrical	**$42**	**$18**	**$32**	**$25**	**$0**	**$117**
DEAN	SERVICE ELECTRICAL SWITCH GEAR	$5	$0	$0	$0	$0	$5
DEAN	LED EXTERIOR WALL LIGHTS	$0	$7	$0	$0	$0	$7
HAYDON	UPGRADE CAFETERIA LIGHTING	$0	$3	$0	$0	$0	$3
HAYDON	SERVICE ELECTRICAL SWITCH GEAR	$0	$0	$0	$0	$0	$0
HAYDON	INSTALL ELECTRIC HAND DRIERS IN RESTROOMS	$0	$4	$0	$0	$0	$4
HAYDON	INTRUSION ALARM REPLACMENT	$0	$0	$0	$10	$0	$10
ROUND	LED EXTERIOR WALKWAY LIGHTS	$7	$0	$0	$0	$0	$7
ROUND	SERVICE ELECTRICAL SWITCH GEAR	$0	$0	$0	$0	$0	$0
WEEMS	UPGRADE CAFETERIA LIGHTING	$0	$0	$0	$0	$0	$0
WEEMS	SERVICE ELECTRICAL SWITCH GEAR	$0	$0	$0	$0	$0	$0
WEEMS	INSTALL ELECTRIC HAND DRIERS IN RESTROOMS	$0	$4	$0	$0	$0	$4
WEEMS	FIRE ALARM UPGRADE	$0	$0	$0	$15	$0	$15
MAYFIELD	INSTALL ELECTRIC HAND DRIERS IN RESTROOMS	$0	$0	$0	$0	$0	$0
METZ	STAGE LIGHTING DIMMER RACK REPAIR	$0	$0	$2	$0	$0	$2
OSBOURN(JW)	SERVICE ELECTRICAL SWITCH GEAR	$0	$0	$5	$0	$0	$5
OSBOURN	SERVICE ELECTRICAL SWITCH GEAR	$0	$0	$5	$0	$0	$5
OSBOURN	LED EXTERIOR WALL LIGHTS	$0	$0	$20	$0	$0	$20
OSBOURN	INSTALL ELECTRIC HAND DRIERS IN RESTROOMS	$10	$0	$0	$0	$0	$10
OSBOURN	LIGHT UPGRADE - '84 ADDITION/JW	$20	$0	$0	$0	$0	$20
	Mechanical - HVAC	**$0**	**$6**	**$19**	**$43**	**$0**	**$68**
MAYFIELD	REBUILD BOILERS	$0	$0	$10	$0	$0	$10
MAYFIELD	REPLACE REFRIGERANT MONITOR	$0	$0	$3	$0	$0	$3
METZ	REBUILD MAIN HVAC PUMPS	$0	$0	$6	$0	$0	$6
OSBOURN	HEAT EXCHANGER REFURBISH	$0	$0	$0	$18	$0	$18
OSBOURN	REBUILD MAIN HVAC PUMPS	$0	$0	$0	$5	$0	$5
OSBOURN	BOILER REBUILDS FROM 2000 RENOVATION	$0	$0	$0	$20	$0	$20
OSBOURN	REPLACE REFRIGERANT MONITORS	$0	$6	$0	$0	$0	$6
	Plumbing	**$41**	**$0**	**$0**	**$35**	**$40**	**$116**
BALDWIN	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$0	$0	$0	$0	$5	$5
DEAN	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
HAYDON	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
HAYDON	WATER HEATER REPLACEMENT	$0	$0	$0	$6	$0	$6
ROUND	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
ROUND	REPLACE PNEUMATIC SEWAGE EJECTION PUMP**	$0	$0	$0	$7	$0	$7
WEEMS	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
MAYFIELD	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
OSBOURN	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
OSBOURN	WATER HEATER REPLACEMENT '84	$6	$0	$0	$0	$0	$6
OSBOURN	AUTO-FLUSH VALVES	$0	$0	$0	$15	$0	$15
OSBOURN	SELF-CLOSING FAUCETS	$0	$0	$0	$7	$0	$7
METZ	5- YR COMPLIANCE HYDRO-TEST SPRINKLER PIPING	$5	$0	$0	$0	$5	$10
	Control Access Systems	**$9**	**$0**	**$10**	**$0**	**$0**	**$19**
DEAN	INSTALL CARD READERS	$4	$0	$0	$0	$0	$4
MAYFIELD	INSTALL CARD READERS	$5	$0	$0	$0	$0	$5
OSBOURN	INSTALL CARD READERS	$0	$0	$10	$0	$0	$10
	Carpentry and Door Hardware	**$48**	**$18**	**$6**	**$58**	**$0**	**$125**
HAYDON	REPLACE LOBBY PLEXIGLASS	$0	$8	$0	$0	$0	$8
HAYDON	REPAIR ALL CASEMENT WINDOWS	$0	$0	$2	$0	$0	$2
HAYDON	CHANGE DOOR KNOBS TO LEVERS THROUGHOUT	$0	$0	$0	$20	$0	$20
WEEMS	REPLACE LOBBY PLEXIGLASS	$0	$3	$0	$0	$0	$3
WEEMS	CUSTODIAL CLOSET #7 DOOR FRAME	$0	$0	$0	$3	$0	$3
WEEMS	EXTERIOR DOOR 27	$0	$0	$0	$3	$0	$3
WEEMS	REPLACE PANIC HARDWARE 3 LOCATIONS	$0	$0	$0	$20	$0	$20
WEEMS	REPAIR ALL CASEMENT WINDOWS	$0	$0	$2	$0	$0	$2
WEEMS	CHANGE DOOR KNOBS TO LEVERS THROUGHOUT	$6	$0	$0	$0	$0	$6
METZ	REPAIR ENTRANCE CANOPYS	$20	$0	$0	$0	$0	$20

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Manassas City Public Schools Facilities Contingency Statement

The success of the Manassas City Public Schools Facilities Maintenance Plan is contingent upon....

Administrators who:

- Recognize that facility maintenance contributes to the physical and financial well-being of the organization
- Understand that facility maintenance affects building appearance, equipment operation, student and staff health, and student learning
- Appreciate that facility maintenance requires consistent funding
- Acknowledge that strategic planning for facilities maintenance is a team effort that requires input and expertise from a wide range of stakeholders
- Demand appropriate implementation and evaluation of facilities maintenance plans

Support Services staff who:

- Appreciate that facility maintenance decision-making is influenced by instructional needs
- Coordinate facility maintenance activities throughout the organization
- Understand a wide range of facilities operations and issues
- Receive training to improve their knowledge and skills related to facilities maintenance
- Educate school and division administrators about facility operations
- Teach other staff how they can help with facilities maintenance
- Cooperate effectively with policy-makers and budgetary decision-makers

Teachers who:

- Recognize that facilities maintenance supports student learning
- Educate students about how to treat school facilities appropriately
- Communicate their expectations for facilities as they relate to enhancing student learning
- Treat facilities with respect

Students who:

- See school facilities as their learning environment
- Treat facilities with respect

Parents and community members who:

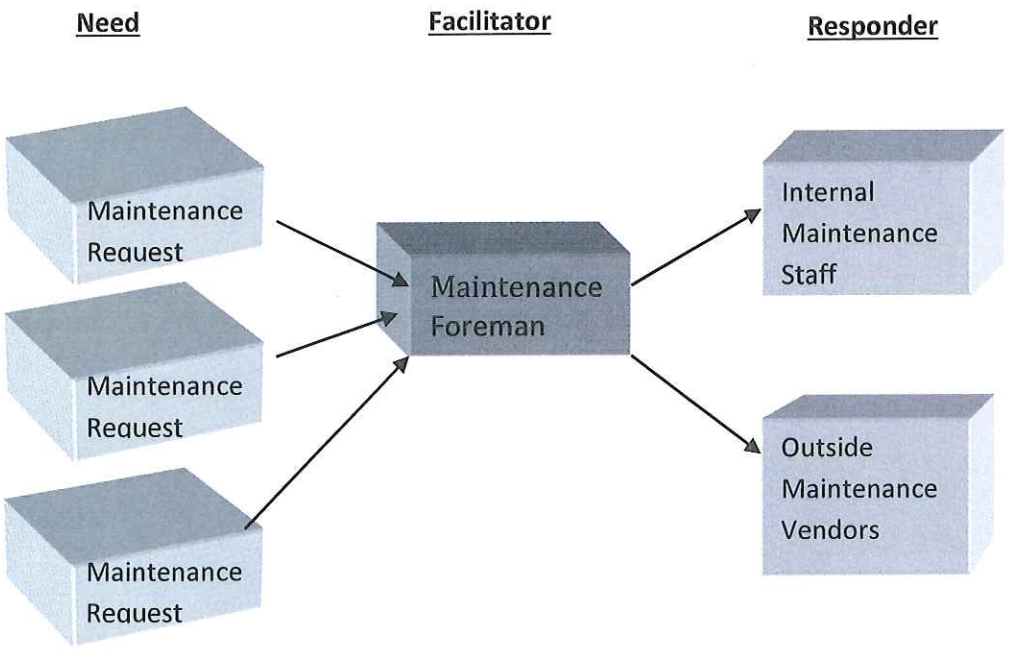
- Recognize that school facilities are the training grounds for future citizens and leaders
- Contribute to school facility maintenance decision-making as requested
  Consent to the financial obligations associated with a good school facility maintenance plan.

Maintenance Work Order Management

The Manassas City Public Schools uses Maintenance Direct, an online application by SchoolDude.com as the division's maintenance work order management system. By using this structure the following outcomes are expected:

- Improve productivity efficiency by reducing data entry and phone work requests
- Improve support by automating communications and feedback with originators
- Automated report generation

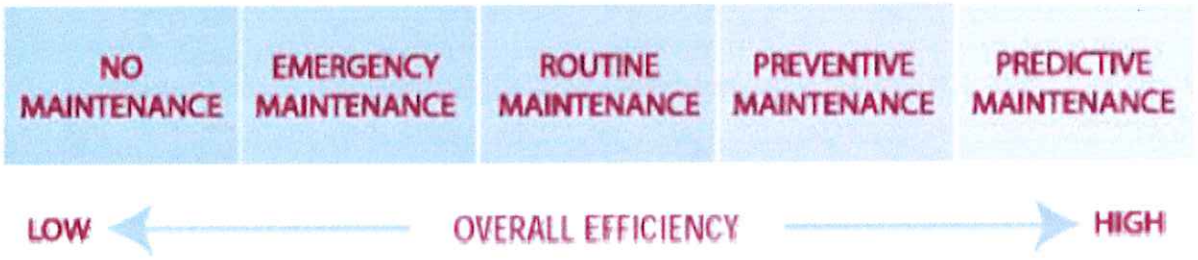
Example Work Flow Process



Maintenance Projects Plan

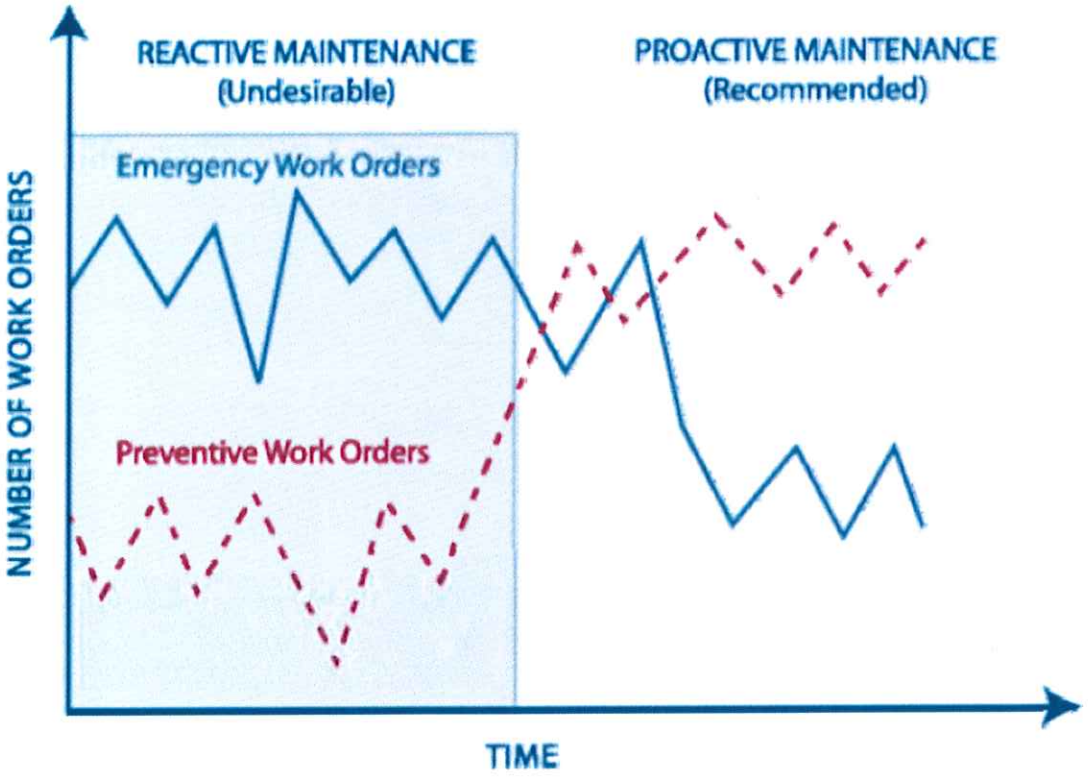
Manassas City Public Schools Division projects can be categorized in the following areas:

- Reactive/Emergency Maintenance Projects
- Routine Maintenance Projects
- Preventive Maintenance Programs
- Capital Projects and Equipment Replacement Programs



A Focus on Preventive Maintenance

In order to reduce reactive/emergency type maintenance and associated inefficiencies, the impact on student learning, safety, and high costs, the Manassas City Public Schools Facilities Maintenance Plan will focus on creating and implementing a detailed preventive maintenance program.



Preventive Maintenance Program

Preventive maintenance (PM) has been considered the most effective way of maintaining building systems and extending the service life of equipment. Most PM programs are based on the assumption that there is a cause and effect relationship between scheduled maintenance and system reliability. The primary assumption is that mechanical parts wear out, thus the reliability of the equipment must be in direct proportion to its operating age. Research has indicated that operating age sometimes may have little or no effect on failure rates. There are many different equipment failure modes, only a small number of which are actually age or use-related.

A good maintenance program is built on a foundation of preventive maintenance. It begins with an audit of the buildings, grounds, and equipment. Once facilities data have been assembled, structural items and pieces of equipment can be selected for preventive maintenance.

Preventive Maintenance is interval-based work that is planned and scheduled to allow maximum efficiency, minimize excessive labor and parts replacement and prolong the useful service life of equipment. A comprehensive PM program allows the building systems to operate at full efficiency for their useful life and can prevent expensive repairs due to equipment failure. PM programs are also required to preserve most equipment warranties. This proactive approach through such tasks as filter replacements, belt tightening/changes, cleaning, etc., ensures that the equipment ages as slowly as possible.

The Support Services Department is committed to expanding its current preventive maintenance program in order to extend equipment life and reduce the number of Maintenance Direct (reactionary) work orders being requested. In order to achieve our goals with regards to the number of preventative maintenance tasks MCPS Support Services Department has determined a need scheduled work orders using PM Direct.

Planned List of PM Schedules.

Example of Preventive Maintenance Tasks:

- Backflow Devices
- Boilers
- Chillers
- Cooling Towers
- Electric Transformers
- Camera Systems
- Fire Alarm Systems
- Hot Water Heaters
- Rooftop Units/Air Handlers

Preventive Maintenance Program (cont'd)

Contracted Preventive Maintenance Services

MCPS currently contracts for the following regularly scheduled preventive maintenance services.

- Elevators - Monthly
- Generators - Semi Annual
- Grease Traps - Quarterly
- 24 Hour Fire Alarm and Intrusion Alarm Monitoring – Invoiced Monthly
- Fire Suppression Systems - Annual
- Fire Extinguishers - Annual
- Fire Sprinkler Systems- Annual
- Kitchen Hoods - Annual
- Integrated Pest Management - Monthly
- Water Treatment- Monthly
- Chiller Inspections – Monthly

Facility / Equipment Condition Assessment

To assist in the formulation of the preventive maintenance program, a detailed equipment assessment will be completed in FY14. A facility assessment (or inventory) will include a comprehensive review of a facility's assets. Facility assessments are a standard method for establishing baseline information about the equipment. An assessment is a way of determining the "status" of the facility at a given time-that is, it provides a snapshot of how the various systems and components are operating. A primary objective of a facility assessment is to measure the value of an aging asset relative to the cost of replacing that asset. Thus, facilities assessments are a tool for projecting future maintenance costs. Equipment condition assessments are an effective method for identifying deficiencies. They typically involve the use of trained personnel who inspect the facility and can identify maintenance and/or repair deficiencies.

Reactive / Emergency Maintenance Projects

Reactive or Emergency Maintenance Projects will continue. Although "breakdown" maintenance is necessary, the objective of the MCPS Facilities Maintenance Plan will focus on a Preventive Maintenance Program in an effort to reduce such reactive or emergency type projects translating to an organized reduction in maintenance expenses.

Routine Maintenance Projects

The Manassas City Schools Facilities Maintenance Plan calls for routine maintenance projects as necessary (i.e. Pencil Sharpener replaced when it fails).

- Maintenance – the act of keeping fixed assets in acceptable condition. It includes preventive maintenance, normal repairs, replacement of parts and structural components, and other activities needed to preserve the asset so that it continues to provide acceptable services and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve the needs different from, or significantly greater than, those originally intended.
- Deferred Maintenance – maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period.

Challenges

Manassas City Public Schools was incorporated in 1975. Since that time the population of this community has increased significantly. This growth has created the need for additional schools. The Support Services Department strives to meet future challenges with reasonable maintenance staffing levels, and the growing space needs requirements through proper planning and coordination with the City of Manassas and the Manassas City School Board.

Meeting Preventive Maintenance Work Order Goals

Because of limited staffing for the maintenance of our schools, preventive maintenance becomes increasingly more important. Preventive maintenance allows for more effective and cost efficient maintenance for buildings and grounds.

Meeting the Challenges of 21st Century

Manassas City Public Schools is committed to the application of technology to improve instructional practices in the classroom; provide students with more opportunities for engaged learning; support accountability and administrative functions; and create new avenues for parental and community involvement. This ever increasing application of technology brings new and unique challenges and opportunities to the maintenance of our schools.

Customer Service Model

A major part of our team purpose is to provide excellent customer service and quality maintenance. In order to do so the following models have been adopted. Employees will use these models as daily tools, in order to meet goals set herein. Here is our approach:

- Immediately greets the customer with a smile.
- Anticipates the customer's needs.
- Meet or exceed the customer's expectations.
- Respects customers and coworkers.
- Is responsible for a solution to customer's need.
- Provides open communication.
- Says thank you!

Maintenance Services Team Responsibilities

Manassas City Public Schools employs a variety of facility maintenance service technicians. These individuals are critical human resource assets that together keep the entire school district operational. All work is assigned using Maintenance Direct, and PM Direct. All Maintenance Service Technicians report directly to the Director of Support Services or Supervisor of Maintenance.

With the construction of new schools, additional maintenance staff will need to be considered in the operational costs of the school. Because of staffing levels and in cases where the work load exceeds the ability of staff to respond to the issue in a timely manner, the department will contract services to assist the maintenance team in order to return the buildings back to operational status. This method is used on an occasional basis.

Technician Procedures

Each work day Maintenance Service Technicians receive assigned work orders electronically and printed copies if necessary. Work is scheduled based on priority and age of work order. During the course of the day, if a work order is deemed to be an Emergency or High Priority, the Maintenance Foreman will call the appropriate technician(s) and route them to the school site.

Maintenance Service Technicians are also required to enter information regarding Action Taken, Labor Transactions and changing the work order status as follows:

- Parts on Order
- Declined – Explanation required.
- Duplicate Request – Include active work order number.
- On Hold – Explanation required.
- Complete – Include work hours and any material costs.

Planned Major Maintenance Repair Projects

Work orders that are potential capital projects beyond the scope of the Maintenance Services Team responsibilities can be identified at any time. If deemed appropriate the Director of Support Services will defer the status of the work order to a future capital project.

Objectives of Maintenance

The primary objective of an effective maintenance program is the retention (in as near original condition as possible) of school buildings, grounds, and fixed equipment assets by means of proper operation, cleaning, repairing, and component replacement throughout the required lifecycle of their use.

Other objectives are to:

- Facilitate continuous use of facilities without disruption to the educational program by applying the principles of Preventive Maintenance (PM) to reduce the interruptions caused by unanticipated repairs.
- Reinforce the learning process by maintaining the interior and exterior of a school to make it a place that students, school staff and local communities will respect.
- Manage all maintenance efforts so that the maximum amount of work is accomplished within the resources provided.
- Provide minor alterations to facilitate the continued functionality of buildings as their educational needs and use changes over time.
- Ensure that facilities are operated in an effective, safe, and economical manner. Provide a maintenance plan for buildings, grounds, and fixed equipment, which eliminates or reduces to a minimum level, the risk of fires, accidents, and safety hazards; thereby, protecting their occupants as well as the public's capital investment.
- Support the goals of the Superintendent and the School Board.

Future Facilities Operations and Maintenance

Almost 90% of facilities related work is reactive; however, best practices suggest that the majority of facilities work should be planned. The critical issue is that it appears that deferred maintenance and capital renewal needs for MCPS facilities are not being completely identified and addressed. The current implementation of an equipment assessment will help the funding forecasts and provide more realistic future plans.

Focus Ares:

- Reduce energy consumption by continued retrofitting of T12 lamps to T8 lamps, installation of occupancy sensors and consideration of LED lighting.
- Support Services will create routine custodial inspections (cleanliness evaluation)
- Reduce chemical usage through custodial supply options.

Expenditures/Budget

Specific expenditures included in this plan include: routine preventive and corrective maintenance, repairs, planned replacement, major maintenance and deferred deficiencies (i.e. backlog reduction).

The most widely recognized and accepted benchmark for facilities funding is often quoted as "maintenance and repair should be in the range of 2 to 4 percent of the current replacement value (CRV) of the facilities. This value includes both operations and capital budget elements "*Committing to the Cost of Ownership: The Maintenance and Repair of Public Buildings*

The report states that "...spending should be, on average in the range of 2 to 4 percent of current replacement values..." The report then clarifies: "An annual maintenance and repair budget will in general be the sum of two components: (1) routine expenditures for maintenance, repairs, and planned replacement and (2) expenditures for correction of deferred deficiencies (i.e., backlog reduction). An M&R budget should not include operations or alterations expenditures."

Today, best practices in educational facilities asset management are still centered on the performance of facility condition assessments and life-cycle analyses to evaluate deferred maintenance and long-term capital renewal. A more proactive capital planning strategy is being driven by Association of Physical Plant Administrators "APPA" Center for Facilities Research (CFaR) in their Strategic Investment Model (SIM). The model considers a total cost of ownership perspective and recommends capturing data elements for analyses that address facility needs, including the following components (APPA, 2004)

Life-Cycle Analyses (LCA)

Life-cycle cost methods are a primary method of managing a facility's long-term assets. Under this method, the assumption is made that a building's life is limited by the durability of its systems and components. While the building structure may last hundreds of years, the HVAC systems, electrical systems and their related components have finite useful lives typically in the range of 20 to 40 years. Key to this method is the development of a database of the facilities and its components. This database is then used as a tool to help inspectors estimate the expected useful and remaining service life of each component.

In its simplest form, the life-cycle cost method used in practice includes the collection of a complete facility inventory by system and component. Thus, costs can be evaluated at a component level or aggregated to provide total anticipated facility costs.

System Categories

Sub-system		Average Life Cycle
1a.	Roofing – Tile	70 years
1b.	Roofing – Metal, Concrete	50 years
1c.	Roofing – Membrane, Built-up, Shingle, Bitumin, Foam	20 years
2a.	Building Exteriors, Doors and Windows (Hard)	30 years
2b.	Building Exteriors (Soft)	20 years
3	Elevators and Conveying Systems	25 years
4a.	HVAC –Controls	20 years
4b.	HVAC – Equipment	30 years
4c.	HVAC- Distribution Systems	50 years
5.	Lighting Systems	20 years
6.	Electrical Equipment	30 years
7.	Plumbing Fixtures	25 years
8.	Plumbing – Rough-in	50 years
9.	Fire Protection Systems	40 years
10.	Fire Detections Systems	20 years
11.	Built-in Specialties and Equipment	25 years
12.	Interior Finishes	15 years