Maintenance and Maintenance Effectiveness

In preparation for the Workgroup on Assessment & Funding of School Facilities
A Multigenerational Task

Objectives: Educational Sufficiency + Fiscal Sustainability

Continual Management and Upkeep…
Ownership and Cycle of Life
Definition of **Maintenance**

The work **required to keep** a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be fully functional and continuously utilized for its expected lifespan, for its intended purpose, and at its maximum energy efficiency.

**Two Types of Maintenance**

1. **Routine Maintenance**

2. **Capital Maintenance**
Major repair, alteration, and replacement of systems, equipment, finished, and components, including their removal and disposal.
Preventive, predictive, and emergent unscheduled tasks and repairs required to ensure that a facility functions according to its design, as well as its expected lifespan.
Types of Routine Maintenance

- **Reactive Maintenance**: Run to failure.
- **Preventive Maintenance**: Planned based on time or usage statistics.
- **Condition-Based Maintenance**: Rules-based logic using sensor data.
- **Predictive Maintenance**: APR & Diagnostics to predict impending failure.
- **Risk Based Management**: Requires comprehensive maintenance infrastructure.

Strategic Proactive Optimized
The Vicious Cycle of Reactive Maintenance

- Standards Drop
- PM is Missed
- More Preventable Failures
- Resources Taken by Breakdowns
- Morale Drops
- More Repeat Work
- Temporary Repairs
- Head / Budget Reduction
- More Repeat Work
What is Preventive Maintenance?

System is inspected at least annually

Maintenance is planned and scheduled with components replaced or repaired periodically

One of the most effective tools to maximize service life of roofing system
Preventive Maintenance Schedules

Based upon manufacturers’ recommendations and system-condition assessments

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<th>TASK</th>
<th>Frequency</th>
<th>Performed by</th>
<th>Jan</th>
<th>Feb</th>
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<td>Inspections</td>
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<td>Building interior common areas--check for damage, make repairs</td>
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<td>Building exterior--check for damage, make repairs</td>
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<td>Units--check for damage, cleanliness, make repairs</td>
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<td>Siding--wash if needed, monitor condition of paint, spot re-paint as needed</td>
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<td>staff</td>
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<td>Windows--wash, re-caulk if needed</td>
<td>annual</td>
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<td>Doors--wash, check weather stripping, re-paint as needed</td>
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<td>staff</td>
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<td>Signage--inspect, clean, repair as needed</td>
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<td>staff</td>
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<td>Lighting--clean fixtures, change lamps as needed</td>
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<td>staff</td>
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<td>Roof--clear debris off flat areas and from drains/scuppers, monitor condition for</td>
<td>monthly</td>
<td>staff</td>
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HVAC System

- Replace all filters
- Inspections
- Grease bearings
- Replace belts
- Room is too hot
- Classroom Closed

Cost to Repair

PREVENTIVE MAINTENANCE ZONE

REACTIVE MAINTENANCE ZONE
The relative age difference between LEAs has remained status quo, but overall the remaining expected life of facilities has almost uniformly declined within each LEA.
How Maintenance is Planned

A Comprehensive Maintenance Plan (CMP)

Defines **Core Service Functions** and identifies the procedures, tasks, and objectives required.

Outlines a methodical and measurable approach to maintenance.

Includes any activities required to keep a building and its component systems in fully functional condition throughout their design lives, and prevents their premature failure. Examples include scheduled inspections, testing and servicing required to keep manufacturer’s warranties in force; and programmed replacement of consumable parts.
Managing Maintenance

Computerized Maintenance Management System (CMMS)

- Assets Management
- Material Management
- User Requests
- Breakdown Maintenance
- Reports
- Preventative Maintenance
- Work Order Management
Managing Maintenance
Spending on Routine Maintenance

Maryland


$767,900,000

Standard: 2% of CRV/year

$1,106,000,000

= 69%
Spending on Capital Maintenance

% CIP Spent on Replacing Building Systems

- 12% in 2006
- 31% in 2019

Graph showing the percentage of capital improvement program (CIP) funds spent on replacing building systems from 2006 to 2019.
Measuring Maintenance Effectiveness

IAC Facility Maintenance Assessment (FMA)

Covers

- Site Exterior
- Building Exterior
- Building Interior
- Equipment and Systems
- Maintenance Management
Improved Maintenance Effectiveness Results in Reduced Costs

- Excess Costs
- Reasonable maintenance costs

Maintenance Costs vs. Maintenance Assessment Score

- Failure
- Reactive
- Preventive
- Predictive
- Best Practices
... A healthy, safe, and educationally sufficient learning environment for every child in every seat in Maryland.

Questions?

iac.msde@maryland.gov
Up next...
Measuring and Calculating a Deficiency Score for a Facility

Webinar 4 of 4
August 20th, 2019
12:00 – 1:00 PM

Workgroup Meeting
August 28th, 2019
9:00 – 1:00 PM

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