



How to Reach Roof Sustainability with Aging Assets and Limited Budgets

Improve your roof portfolio and reduce capital and operating expenditures all while setting building portfolio up for sustainability success



Roofs | Walls | Pavement



APPA 2019

What We Want To Share With You


- Facility Asset Management Insights & Trends
 - What we're seeing in the industry
- Case Study: D.C. Public Schools Portfolio
 - First-ever comprehensive, SmartRoof, clean technology implementation
- Proactive Asset Management Approach
 - Why it's a first priority
- How DCPS Overcame Its Challenges
- Incorporating Sustainability



Asset Management Insights

Most educational institutions manage roof assets reactively <small>(Source: BLUEFIN client base)</small>	Small in-house roofing teams often means schools are chasing leaks and not forecasting change
Getting by with less <small>(Source: BLUEFIN client base)</small>	CapEx and OpEx budgets continue to decrease for Higher Ed and K-12
Aging buildings of the 1960s <small>(Source: State of Facilities in Higher Education 2017 report)</small>	Represents 40% of the space on campuses
Depreciating buildings of the 1990s-2000s <small>(Source: State of Facilities in Higher Education 2017 report)</small>	Requiring massive maintenance on campuses in the next decade
US K-12 sector spends \$6 billion annually in the US on energy bills <small>(Source: Department of Energy)</small>	A 20% energy reduction would result in cost-savings of \$3.3 billion+

D.C. Public Schools (DCPS)




This K-12 school district includes:

- 152 buildings
- 7.5M million square feet of roofs


CHALLENGES:

- Old/historical buildings with chronic leaks
- Broken leak response process
- Lack of clarity on assets and their condition
- No clear way to manage this expensive portfolio
- Total number of roof sections: 1,372
- Mix of steep-slope and low-slope rooftops



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Roof Management Program Model




Roof Management Program

Phase	Duration	Savings (%)	Key Activities
Phase 1	0-9 Months	5%	Assess with PM, RAMP (50% leak reduction); Defer non-emergency replacement
Phase 2	6-18 Months	15%	Address repair backlog; Optimize leak response mgmt.; High priority restore/replace; Annual Assess/PM
Phase 3	12-36 Months	40%	Incorporate Sustainability; Roof service life extension; Restoration opportunities increase over time; Replacement budget certainty; Test potential sustainability solutions; Optimize assets from an energy standpoint


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DCPS Positive Outcomes

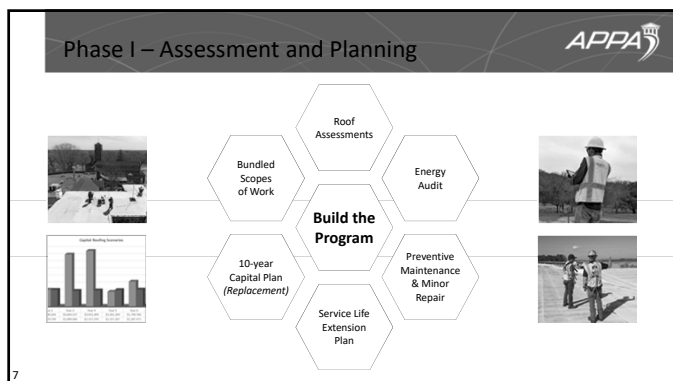


- Leaks dropped by 75%
- Capital requirements dropped by 25%
- Safety issues are resolved
- SmartRoof Program
- More budget dollars go towards classroom enhancements
- Job creation: 100+
- Reduces manpower needed

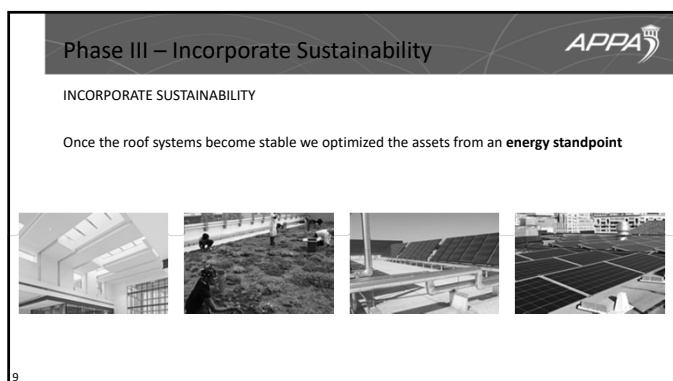
How? DCPS moved from a reactive to a proactive roof asset management approach and incorporated sustainability in three phases




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DCPS/DGS Sustainability Program Goals 

1. Maximize Roof Life Potential
2. Reduce Building Energy Consumption and CO2 Emissions
3. Employ the Roof as a Platform for Renewable Energy
4. Demonstrate Best Practices
 1. Contractor training
 2. Energy savings competition
 3. SmartRoof
 4. Developed standards for replacements



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Considered a Range of Sustainability Solutions 

Ineffective

Conserve Energy: Insulating, air-barrier, and day-lighting

Reflect Heat: Reducing temperatures across the city

Positive Atmospheric Impact: Cool roof restorations

Effective


Manage Carbon: Tracking and reducing carbon footprints

Lead: Demonstrating best practices benefiting the community


Very Effective

Use Solar Energy: Producing electricity and hot water


Reduce Runoff: Collecting, retaining, and re-using rainwater



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Solutions | Use Solar Energy 

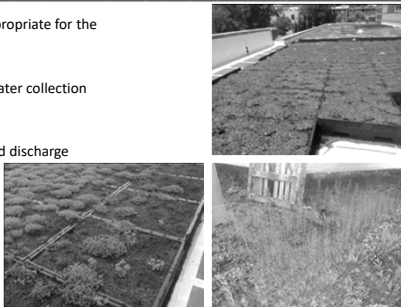
- 245 Acres of potential roof area for solar
- Solar energy technology is maturing
 - PV
 - Solar Thermal
 - Storage
- Prices are low and the credit market is good
- Rooftop Photovoltaic PV systems
 - Power Purchase Agreements (PPA) make scale possible
- Solar Thermal
 - Lower-cost option can create present very high ROI opportunities for building heating, cooling and domestic hot water use



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Solutions | Reduce Run Off APPA

- Vegetative roofs that are appropriate for the local climate
- Roof and pavement storm water collection and re-use onsite
- Irrigation, gray water, delayed discharge



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Leadership in the Community APPA

“Buildings that teach” and thereby transfer useful knowledge to the community

- Students learn botany on vegetative roofs
- Vocational education to students on renewable energy technologies
- Job creation and training in the local community
Viable skills that cultivate real workforce jobs






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Integrated Approach to Assets and Energy APPA


- Roofs will continue to protect occupants and building interior from weather
 - Starting with a stable roof portfolio is key
 - Stabilizing roofs need not be expensive with an asset management program
- Holistic and objective approach to the building portfolio
 - No bias toward particular technologies
 - Considers the whole portfolio: no cherry picking of projects
 - Tried all renewable roof options and learned what worked best
- Simplified procurement
 - An integrated approach significantly reduces number of transactions
 - Still includes local vendors

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Questions? 



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