Smarter Remediation Planning in Lieu of Reactive Maintenance

Introductions

Name: **Doug Renkosik**, CPMM, Director of Operations & Maintenance
Role: Speaker
- *Huntley Community School District 158*

Name: **Kimberly Brisley**, ESG Account Manager – Illinois
Role: Speaker
- *Energy Systems Group*

Name: **Dan Barrie**, CPMM, Director of Operations
Role: Moderator
- *East Main District 63*

Smarter Remediation in Lieu of Reactive Maintenance

- Interactive Exchange of Best Practices
- Resources for Future Reference
- Q&A Session

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Huntley CSD 158 Roof System – ***Restoration or Replacement?***

Run to failure or replace at expected life cycle/when failures start appearing?

- *Added cost of insulation replacement adds $11.00 to $12.00 psf to project cost*

What type of roof system for replacement?

- *Replacement of EDPM - $12.00 psf*
- *Pressure wash and coat with liquid applied membrane - $12.00 psf*
- *Restore liquid applied membrane system at year 20 (clean & top coat only) - $4.00 psf*

40 year life cycle comparison for two different 20-year systems

- Replacement single ply EPDM 2 cycles = $24.00 psf
- Restoration liquid applied roofing 2 cycles = $16.00 psf

savings = $8.00 per sq ft or $0.20 psf/yr on our budget

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Huntley CSD 158 Pavement System Replacement

Run to failure or replace at expected life cycle/when failures start appearing?

- *Added cost gravel base replacement*

What type of pavement system replacement process?

- *Option 1: Replacement of gravel bases and 2 course asphalt - $3.60 psf*
- *Option 2: Full depth reclamation (FDR) gravel base and 2 course asphalt - $3.11 psf*
  - *w/ Option 2: Grind and replace surface course asphalt at year 15 - $1.65 psf*

30 year life cycle look

- Replacement gravel base and two courses of pavement = $7.20 psf
- FDR with two course asphalt = $4.76 psf

savings = $2.44 per sq ft or $0.08 psf/yr on our budget

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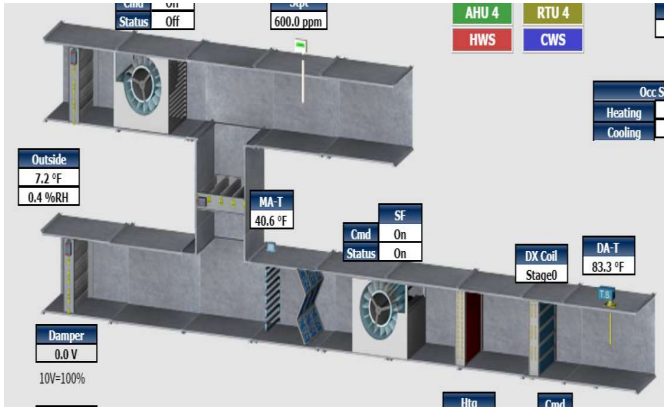

Huntley CSD HVAC BAS Replacement

System was obsolete – unsupported by hardware/software manufacturers

Challenges

- *Estimated system replacement costs - $2,000,000*
- *District capital projects replacement budget $750,000 per year*
- *District had no ability or interest to borrow money to fund replacement due to financial position*

Solutions

- *Enhance sequences of operation provide energy budget savings -$347,00 per yr. savings*
- *Capture incentives from ComEd and NiCor – first cost reduction - $737,000*
- *Bundle lighting retrofit to model to enhance Return On Investment (ROI)*
- *Use Guarantee Energy Savings format for procurement model from Illinois State statute*

Energy budget pays debt service

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Challenges

- *Existing 250-ton chiller at predicted end of life and not premium efficiency*
- *Building addition needs new HVAC system – ME proposed new RTU w/ DX cooling*

Solution

- *Replace existing chiller with larger, premium efficiency unit to serve addition*

Outcomes

- *Existing chiller replaced from building addition budget*
- *Reoccurring service cost for cooling systems limited*
- *Overall energy consumption efficiencies realized*

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Challenges

- *Building additions requiring more housekeeping services workload*
- *Labor workforce growth is challenging*

Solutions

- *Replace existing custodial equipment with higher productivity equipment*
- *Invest in new building finishes which are lower maintenance (e.g., LVT in lieu of VCT)*

Outcomes

- *Limit workforce growth*

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Challenges

- *Additions planned to High School (with a 33% footprint increase) on a constrained budget with limited appetite for increased energy consumption cost*

Solution

- *Contact the Smart Energy Design Assistance Center (SEDAC) for peer review of the designer team's plans and specifications for consideration in beyond energy code improvements with attractive Return on Investment (ROI) calculations*

Outcomes

- *Alternate bids taken for premium equipment / infrastructure with defined energy savings calculated by SEDAC for educated decision making. Several alternate bids were accepted with a net outcome of very limited increase in energy costs for the larger facility.*

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Maintain a Deferred Maintenance Capital Projects Plan

PROCESS – Part 1

Inventory Physical Plant Infrastructure

- *Construction Drawings*
- *Satellite Measuring Tools*
- *Bids: ask for take-off with bid for bid analysis*

Post Expected End of Life for Each Component

- *Industry Standards (ASHRAE, ASCE)*
- *Your District's Experience*
- *Manufacturer's Warranty*

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Maintain a Deferred Maintenance Capital Projects Plan

PROCESS – Part 2

Post Replacement Value for Each Component

- *Cost History from Prior Construction*
- *Contractor/Consultant History*
- *R.S. Mean's*
- *Your Network of Peers*

Sort by Year

Move Items Around to Meet Fiscal Office Budget Plan for Short Term

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Maintain a Deferred Maintenance Capital Projects Plan

Examples of Categories to Include/Consider

Asphalt repairs
Asphalt replacement
Asphalt Sealcoat and crackfill asphalt pavement
Athletic floor replacement
Bleacher system replacement
Boiler preheat makeup air systems
Building Automation System updating
Cafeteria tables replacement
Carpet replacement
Casework replacement and rearrangement
Chiller replacement
Concrete walk replacement
Condenser replacements, large
Infrared scan eletrical distribution system
Life Safety Survey - 10 year required by State Statute
Stadium lighting retrofit
Playground safety surface management
Retrofit Lighting Systems
Roof replacements / restoration
Roof-top (RTU) HVAC equipment replacement
Rubber stair tread replacement
Safety Enhancements
Snow removal tractor replacement
Sprinkler dry pendant heads replacements
Synthetic stadium field material replacement
Tennis court resurfacing - 8 year cycle
Track resurfacing
Tuckpointing
Unit ventilator bushings replacement-79 units
Vehicle replacement-O&M
Water heater replacement
Window curtain wall restoration
Wood gym floor restoration

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Maintain a Deferred Maintenance Capital Projects Plan

Outcomes

- *Average Annual Budget for Long-term Planning*
- *Proactive Life Cycle Replacement in Lieu of Emergency Parts*

HCSD158 Capital Replacement Life Cycle Study
Ten Year Look Forward
Executive Summary Sort By Year

last edit 7/14/2021 *SPECIAL NOTE: All costs posted are present value*

Fiscal Year	Physical Plant Needs Year Budget	
FY22	$	2,114,664
FY23	$	4,140,844
FY24	$	3,719,525
FY25	$	2,871,076
FY26	$	1,564,840
FY27	$	2,129,338
FY28	$	1,466,928
FY29	$	540,062
FY30	$	3,601,289
FY31	$	2,084,112
Ten Year Total Cost	**$**	**24,232,679**
Average Annual Cost	**$**	**2,423,268**

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Challenges

- *Getting your Board to proactively invest in deferred maintenance challenges and risks*

Solutions

- *Building Blocks*
- *Strategic Master Planning approach*

Outcomes

- *Increased Education and Engagement*
- *Improved Prioritization of Addressing Real Risk*
- *Proper Annual Budget Allocation*

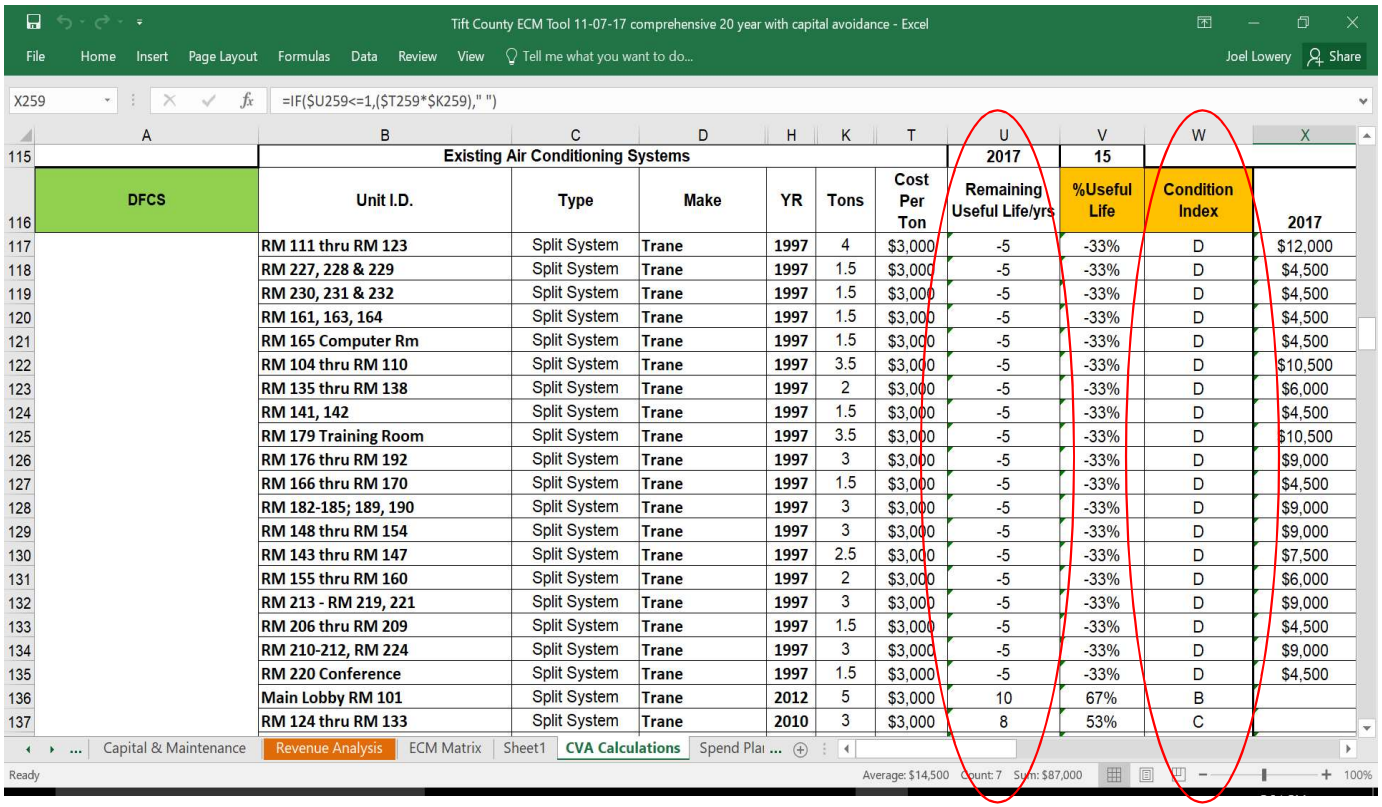
Category	Description	Examples of Facility Needs
A (7 Facilities)	▪ Highest amount of deferred maintenance ▪ End of useful life assets ▪ Asset replacement required	▪ Replacement of HVAC systems ▪ Lighting upgrades ▪ Temperature control system ▪ Air distribution systems upgrades
B (5 Facilities)	▪ Assets still in useful life ▪ Some deferred maintenance ▪ Retrofit/repair of assets required	▪ Lighting ▪ Small HVAC ▪ Water ▪ Temperature control ▪ Building envelope
C (6 Facilities)	▪ Assets early in life cycle maintenance equipment ▪ Energy retrofit candidate	▪ Lighting ▪ Temperature control ▪ HVAC ▪ Building envelope ▪ Plug load

What is Capital Volatility Index

- Capital Volatility Index (CVI) is magnitude of capital needs required for replacement within a 3 year period as a percentage of total infrastructure in a facility
- Calculated based on age of the infrastructure, condition of the equipment, geographic location of infrastructure and useful life
- Calculated per piece of infrastructure and aggregated to create the District's Capital Volatility Index
- Any Schools with CVI above 50% indicates a need for an action plan for replacement and capital planning
- A low CVI reflects overall healthy infrastructure – yet capital needs still exists in these buildings

Capital Volatility Analysis

Determine Risk of Replacement



Tift County ECM Tool 11-07-17 comprehensive 20 year with capital avoidance - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do... Joel Lowery Share

X259 =IF($U259<=1,($T259*$K259)," ")

	A	B	C	D	H	K	T	U	V	W	X
115		Existing Air Conditioning Systems						2017	15		
116	DFCS	Unit I.D.	Type	Make	YR	Tons	Cost Per Ton	Remaining Useful Life/yrs	%Useful Life	Condition Index	2017
117		RM 111 thru RM 123	Split System	Trane	1997	4	$3,000	-5	-33%	D	$12,000
118		RM 227, 228 & 229	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
119		RM 230, 231 & 232	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
120		RM 161, 163, 164	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
121		RM 165 Computer Rm	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
122		RM 104 thru RM 110	Split System	Trane	1997	3.5	$3,000	-5	-33%	D	$10,500
123		RM 135 thru RM 138	Split System	Trane	1997	2	$3,000	-5	-33%	D	$6,000
124		RM 141, 142	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
125		RM 179 Training Room	Split System	Trane	1997	3.5	$3,000	-5	-33%	D	$10,500
126		RM 176 thru RM 192	Split System	Trane	1997	3	$3,000	-5	-33%	D	$9,000
127		RM 166 thru RM 170	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
128		RM 182-185; 189, 190	Split System	Trane	1997	3	$3,000	-5	-33%	D	$9,000
129		RM 148 thru RM 154	Split System	Trane	1997	3	$3,000	-5	-33%	D	$9,000
130		RM 143 thru RM 147	Split System	Trane	1997	2.5	$3,000	-5	-33%	D	$7,500
131		RM 155 thru RM 160	Split System	Trane	1997	2	$3,000	-5	-33%	D	$6,000
132		RM 213 - RM 219, 221	Split System	Trane	1997	3	$3,000	-5	-33%	D	$9,000
133		RM 206 thru RM 209	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
134		RM 210-212, RM 224	Split System	Trane	1997	3	$3,000	-5	-33%	D	$9,000
135		RM 220 Conference	Split System	Trane	1997	1.5	$3,000	-5	-33%	D	$4,500
136		Main Lobby RM 101	Split System	Trane	2012	5	$3,000	10	67%	B	
137		RM 124 thru RM 133	Split System	Trane	2010	3	$3,000	8	53%	C	

Capital & Maintenance | Revenue Analysis | ECM Matrix | Sheet1 | CVA Calculations | Spend Plan ...

Ready Average: $14,500 Count: 7 Sum: $87,000 100%

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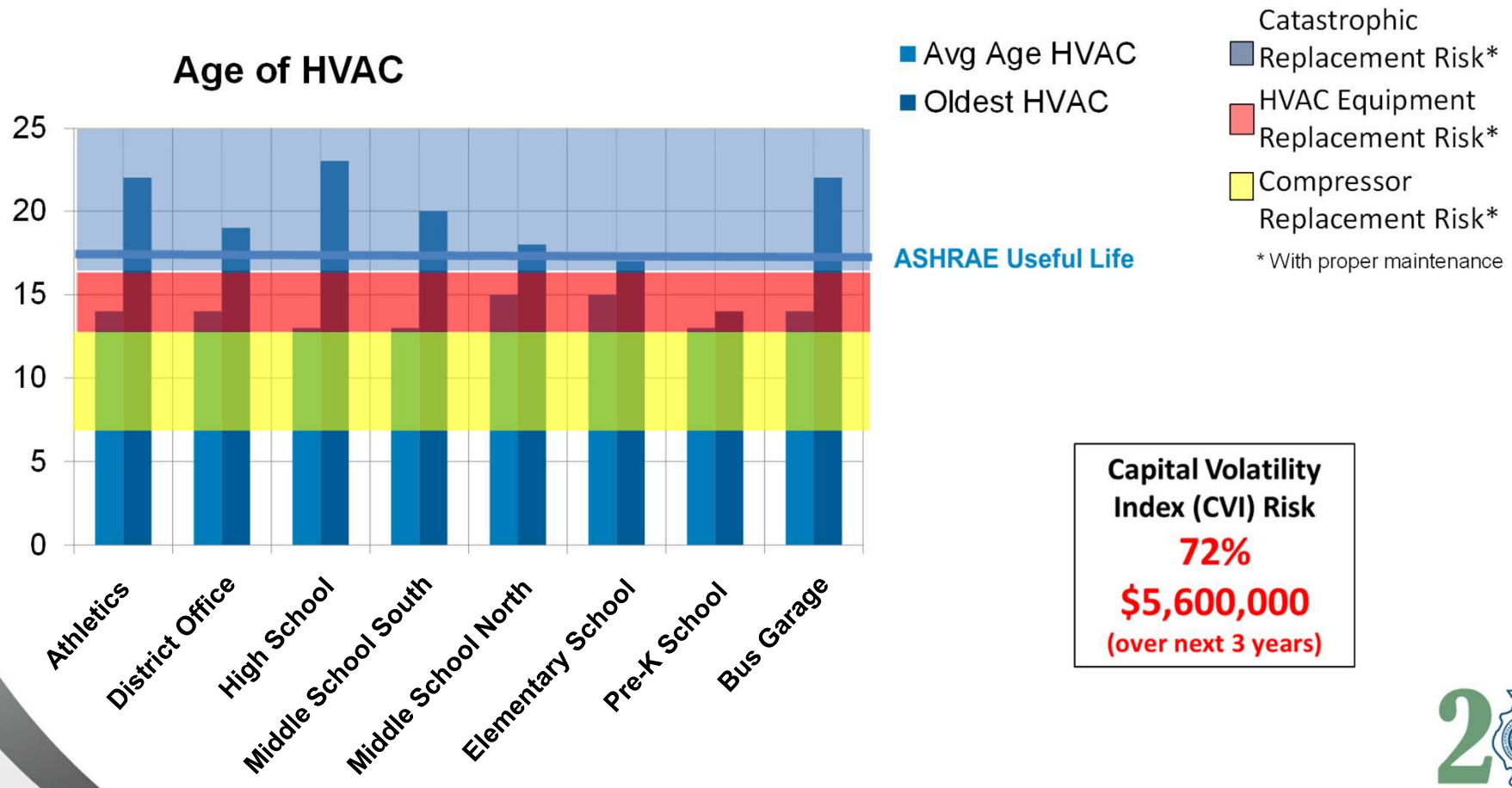
Audit Findings



Capital Volatility Index (CVI) Risk

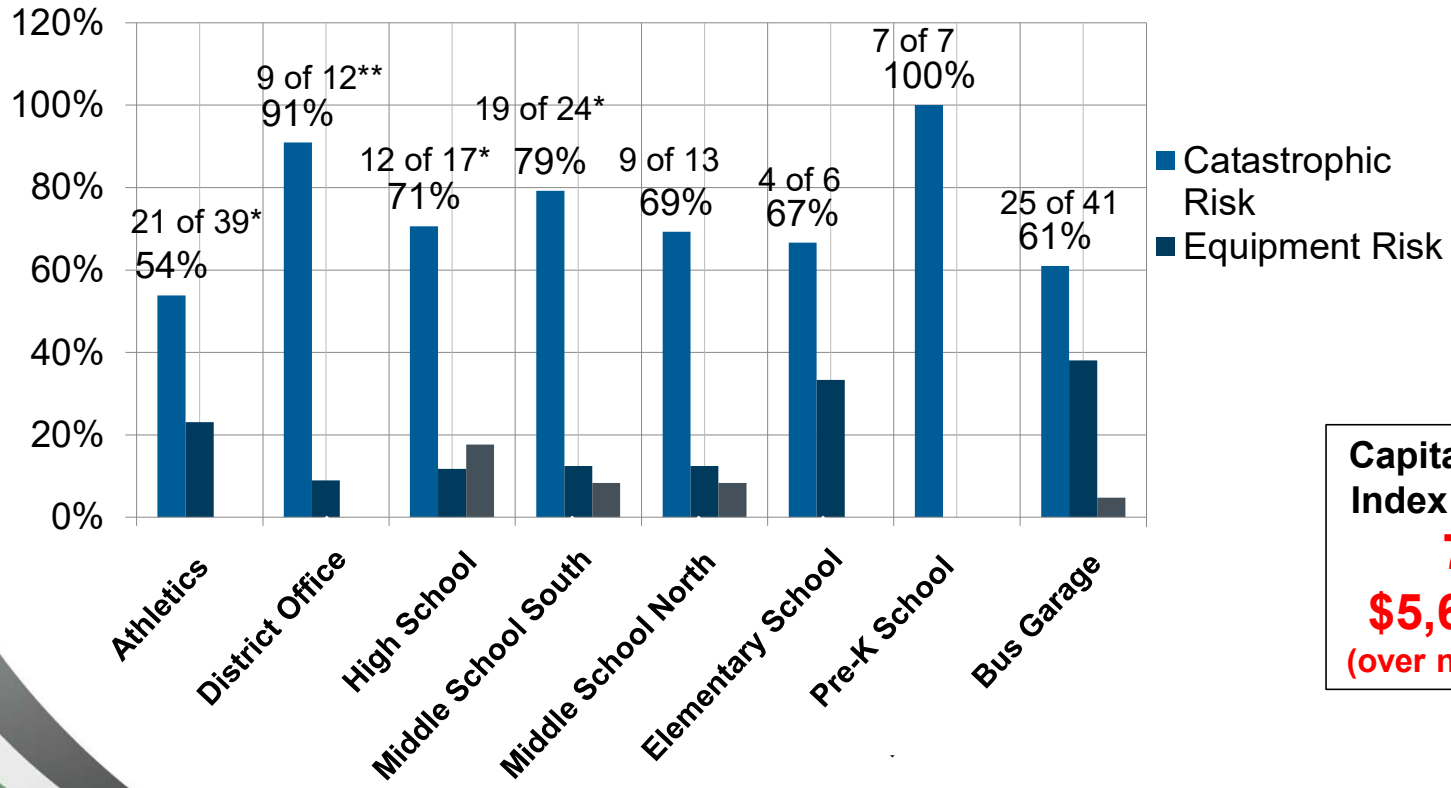
72%

$5,600,000

(over next 3 years)

Audit Findings - Sampling

Percentage of HVAC Equipment That Needs Replacement



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(over next 3 years)

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Challenges

- *Many different business models to address deferred maintenance projects*

Solutions

- *Leverage best approach based on your needs and project scope*
- *Most complex work should leverage Illinois Legislation for Schools*

Outcomes

- *Construction Management At-Risk (CMAR) legislations [IL Statue CMAR 50 ILCS 510/1-9: RFQ Process]*
- *Energy Savings Performance Contracting (ESPC) legislations [IL Statue ESPC 105 ILCS 5: RFP Process]*

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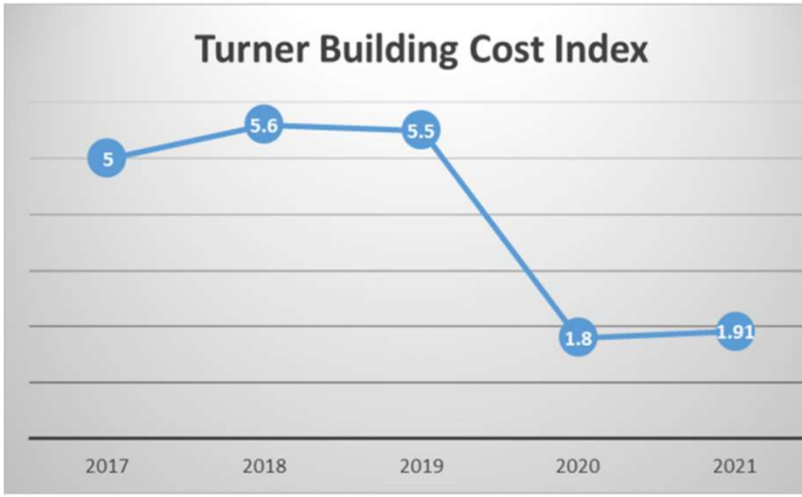
We owe it to our schools to educate others and proactively address our compounding deferred maintenance needs

- During COVID, many districts have not been making investments in infrastructure
- Recently, more concern about costs and availability of materials and labor for large construction projects
- Supply chain disruptions have continued at unprecedented levels especially in the areas of:
  - ✓ lumber, **steel, copper, aluminum,** PVC, and gypsum
- Based on Turner Building Cost Index (Q4) we know increase in costs from Q3 +1.91%
- At ESG, we have seen some stabilization in material prices but do not expect them to return to pre-COVID levels:
  - ✓ Lead time on equipment still of concern
  - ✓ Select Design Build Partner who can make sure price and delivery are clearly established for you



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Risks of Deferring Maintenance – Cost of "Do Nothing" is Real and Can Have Negative Impact on Your District

- Inflation is escalating and is now running close to 15% - 20% per year
- Fluctuating Financing Rates/Missing Decade Low Interest Rates
- Supply Chain Delays
- Labor Shortages
- Need Proactive Approach to:
  - ✓Negotiate Best Pricing
  - ✓Get Best Companies to Deliver Scope
- Missing Out on Available Incentives and Grant Money

Resources

- https://smartenergy.illinois.edu/
- https://www.comed.com/WaysToSave/ForYourBusiness/Pages/BusinessPromo.aspx
- https://www.nicorgas.com/business/ways-to-save.html
- https://www.peoplesgasdelivery.com/savings/business/rebates
- https://amerenillinoissavings.com/business/
- https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=726&ChapterID=11
- https://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=010500050K19b-5

Questions and Answers

We thank you for your time!

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