



Communications Facilities Maintenance Approach

Paul Clark



WASHINGTON ASSOCIATION of
MAINTENANCE and OPERATIONS
ADMINISTRATORS
www.wamoa.org



*Facilities
Maintenance
Annual Report
2009 - 2010*

Paul Clark

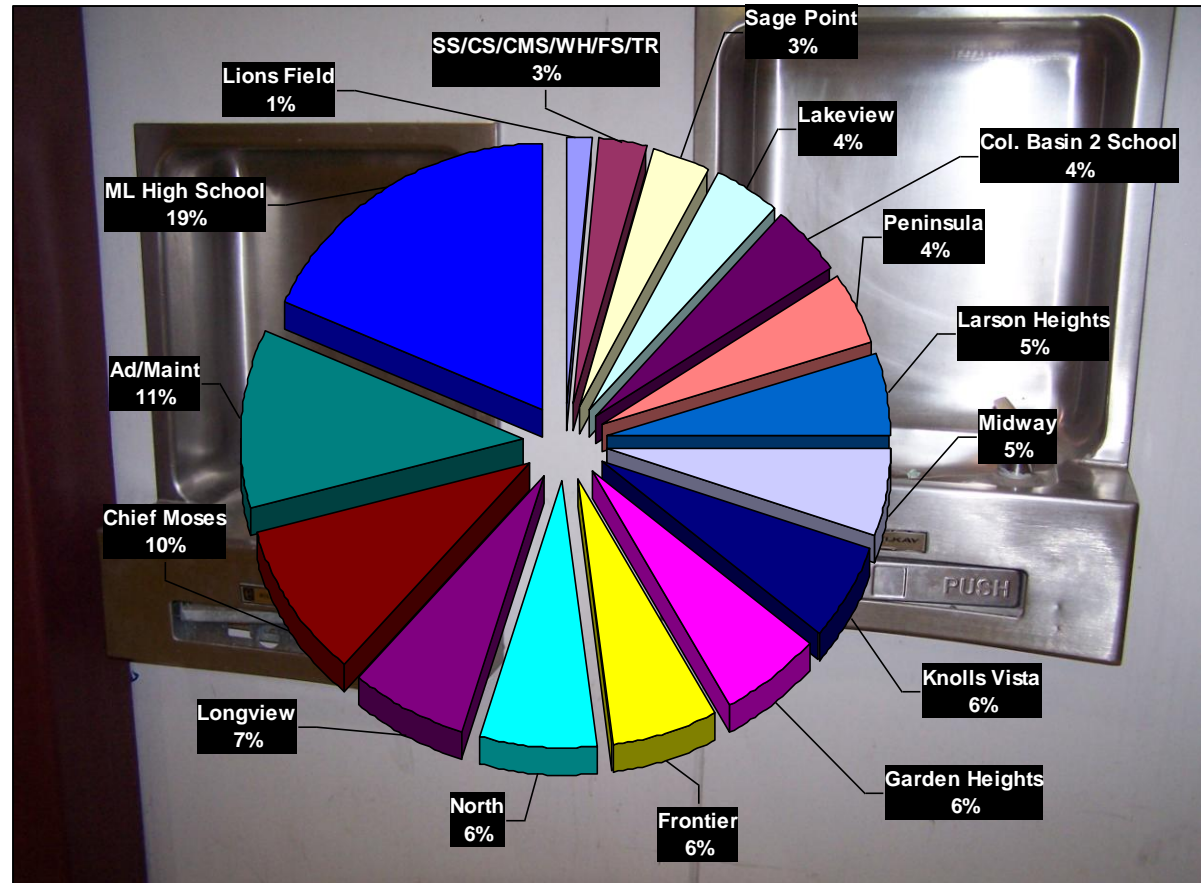


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Collective Workorders

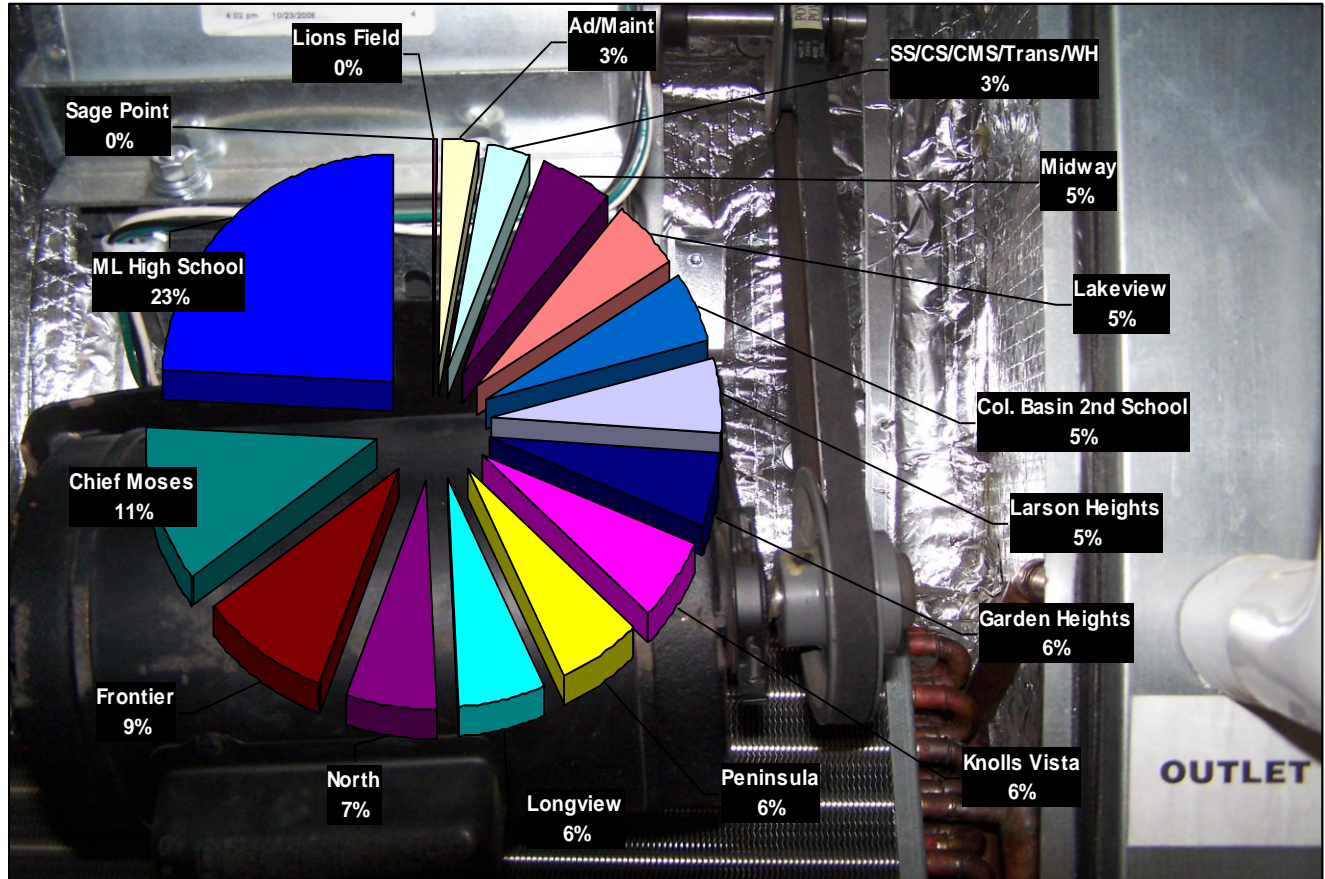
The distribution of corrective work orders has remained consistent throughout our District for the past 10 years despite consistently adding new sites and areas of maintenance responsibilities!





Preventive Workorders

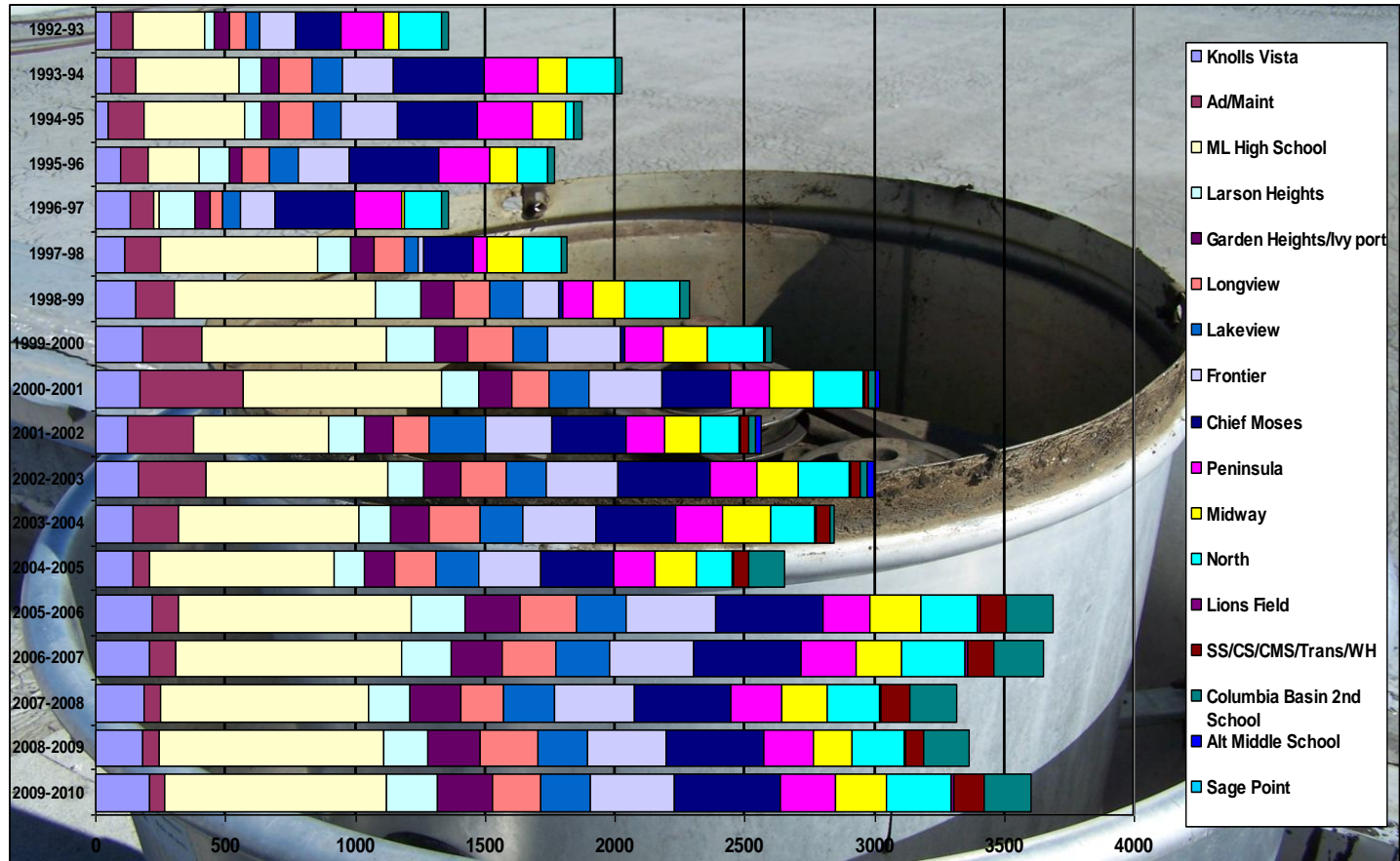
PM workorders mirror the distribution of corrective wo's between sites with slight variations; a good indicator of our program's consistency!





Preventive Workorders by year

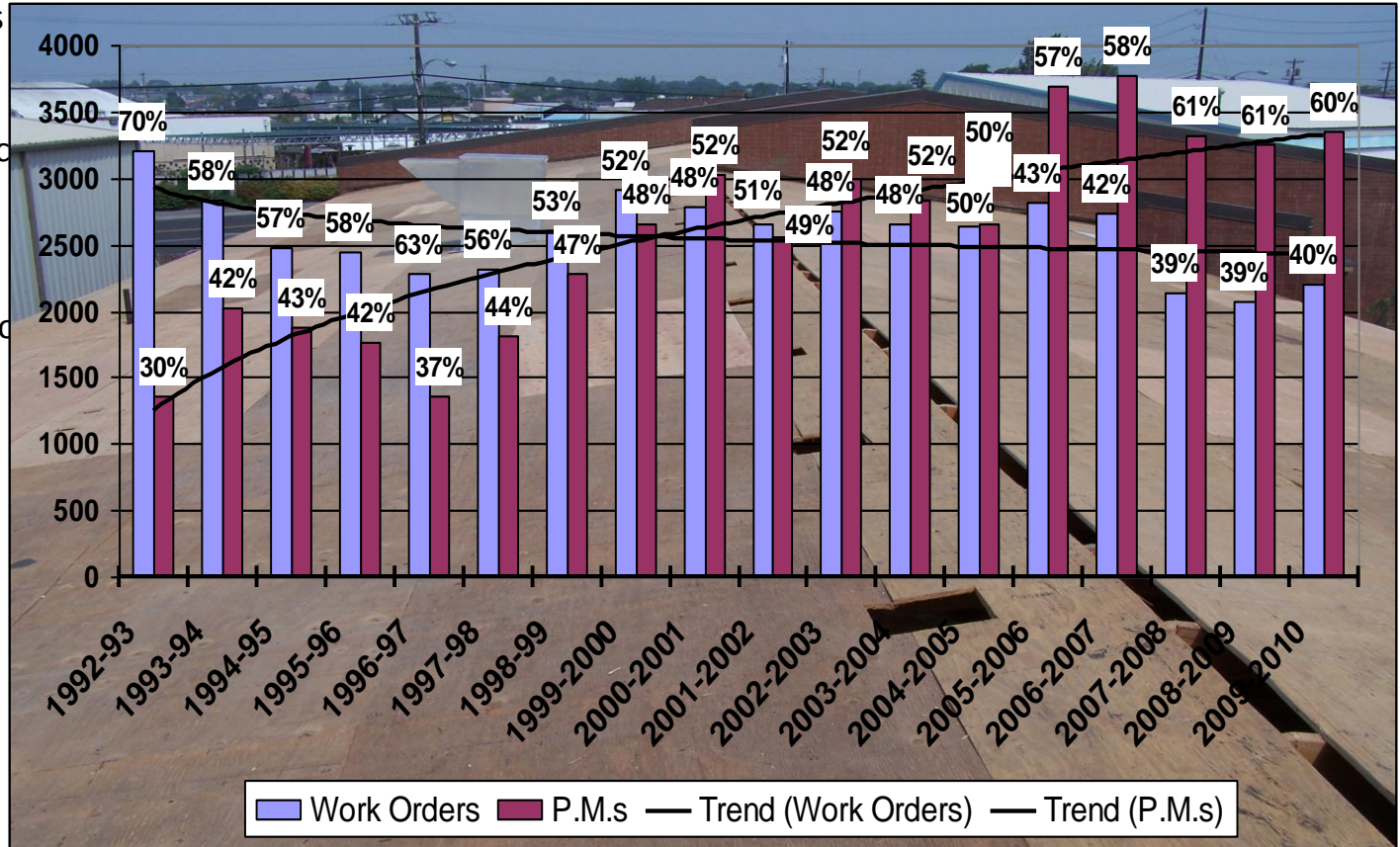
Corresponding to the 2nd graphic, this shows PM WO history. Our increasingly proactive program seems to be leveling off after 13 years.





Work Load Trend by Year

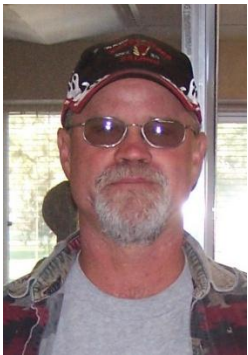
This graphic illustrates the relationship between PM & Corrective maintenance. PM is more cost effective, & efficient, providing the highest level of stewardship for our tax funded investments.





Labor Resource Allocation

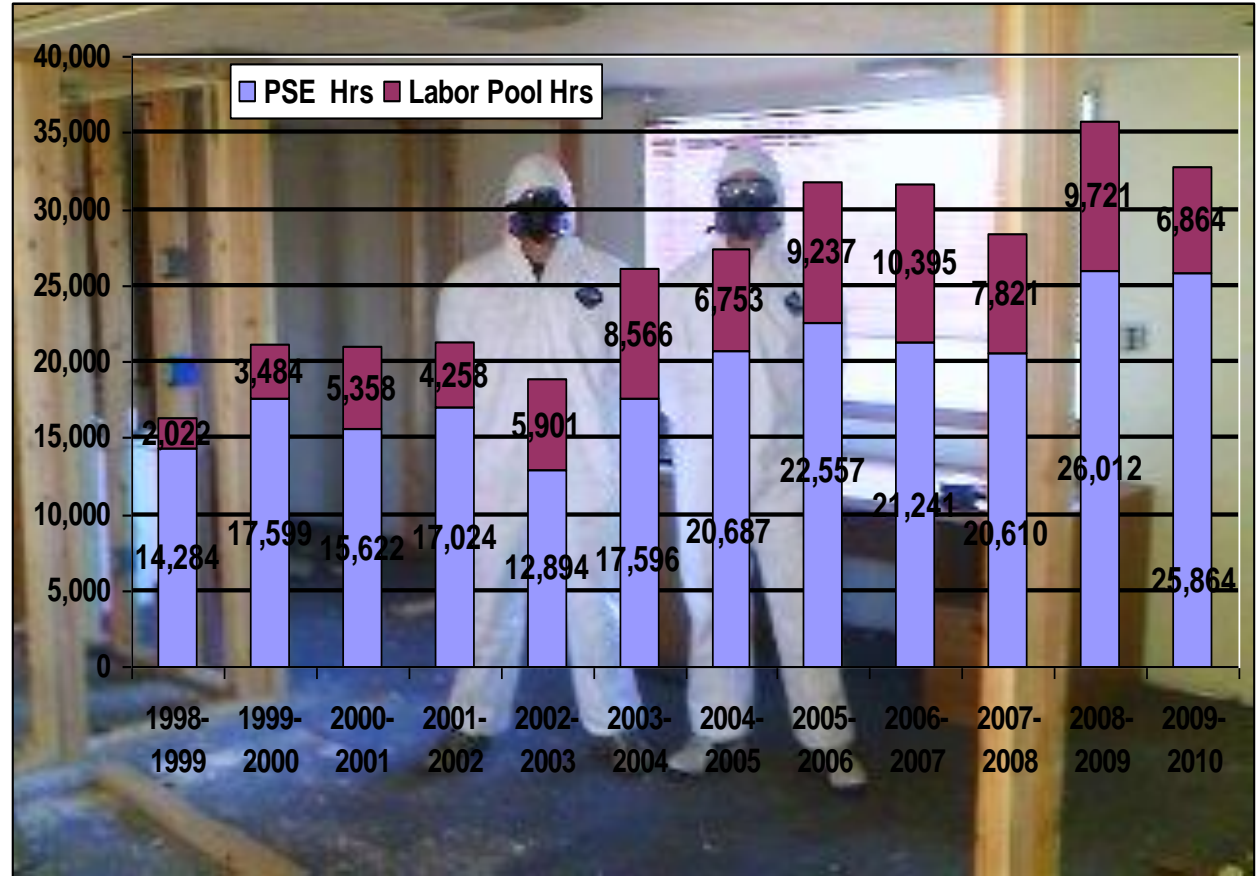
Seasonal labor positions including mowing, general grounds crew, parking lot and building painting, weed control, and remodeling projects are all additional labor costs every summer break.





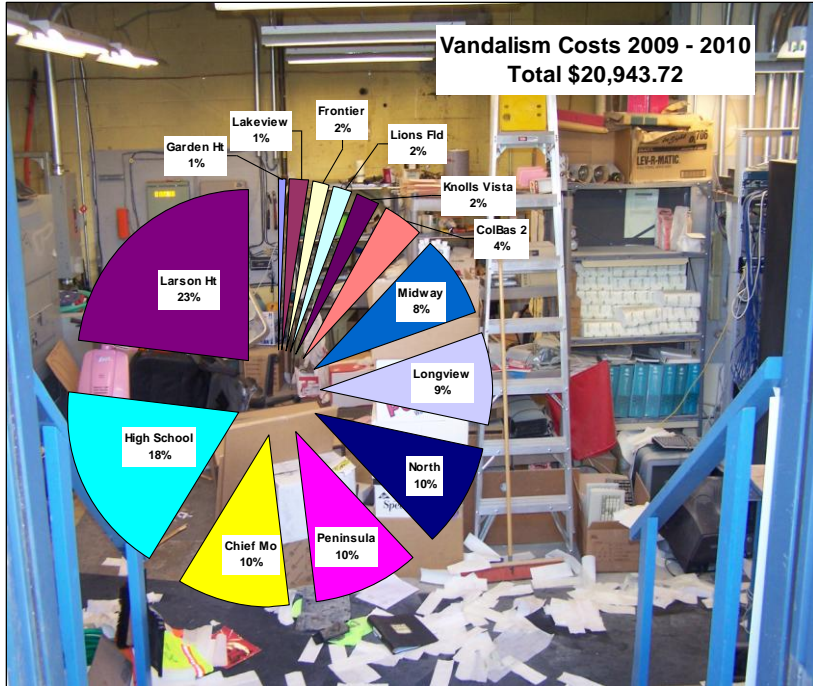
Resource Allocation By Year

The use of temporary help is an increasingly integral part of being able to accomplish an increasing workload in capital projects and grounds, helping to control labor costs and manage continually expanding workloads.

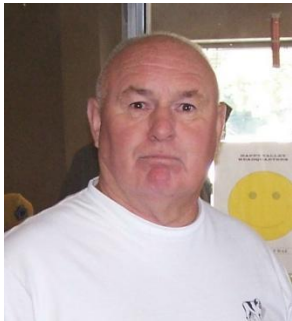
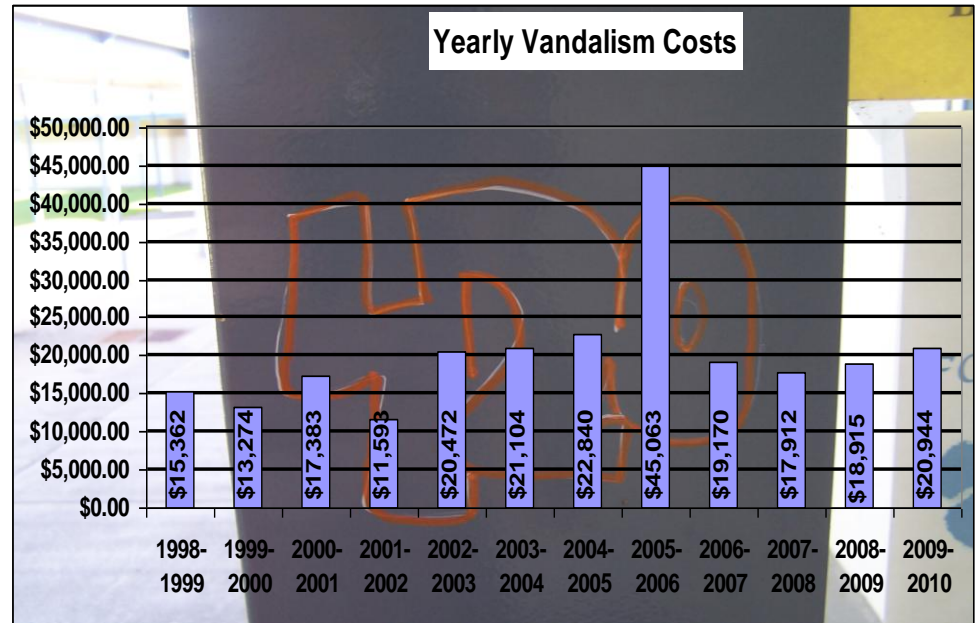




Vandalism Costs



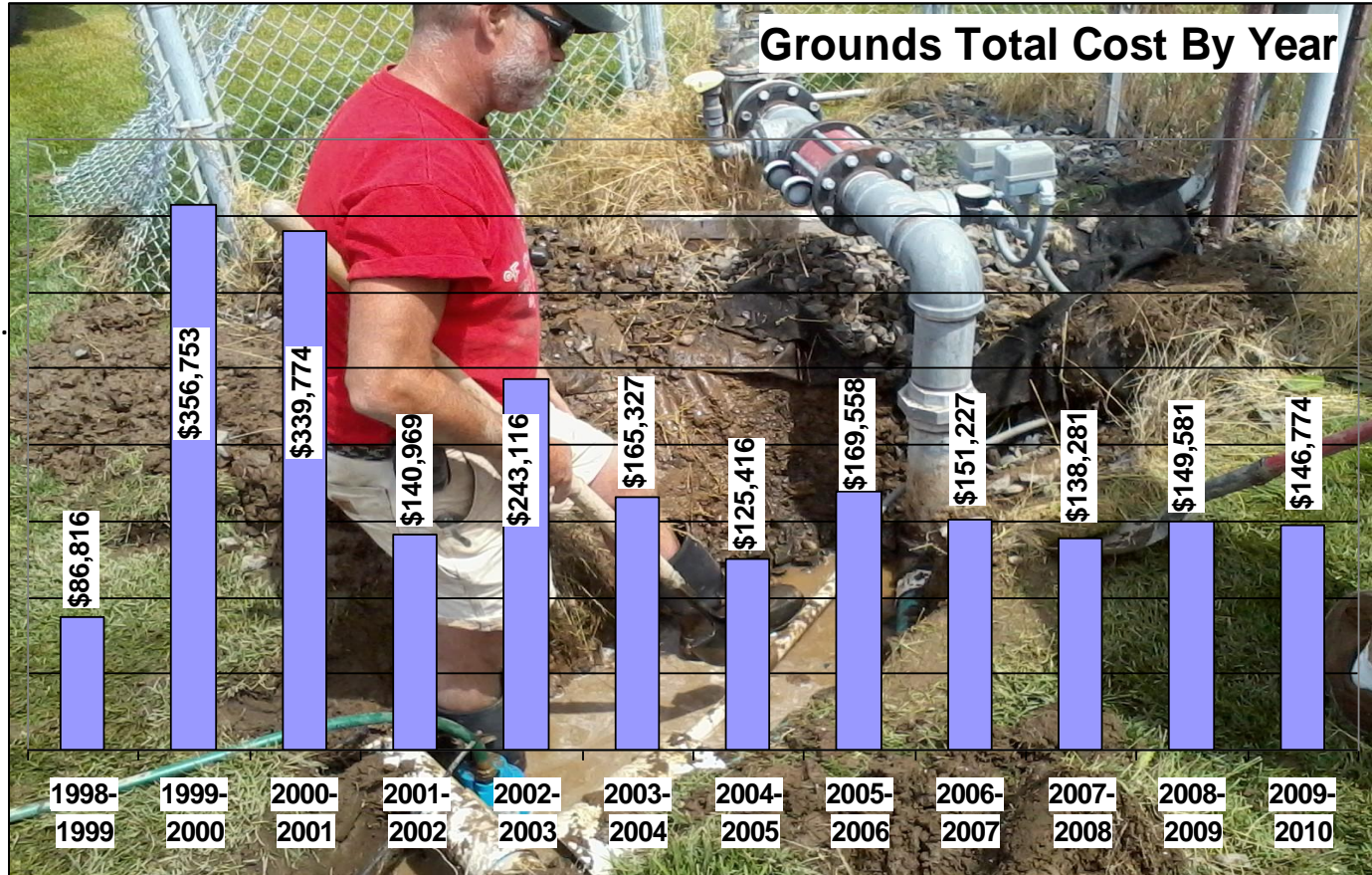
Vandalism costs are the most frustrating for this department, preventing the funding of way more worthwhile work!



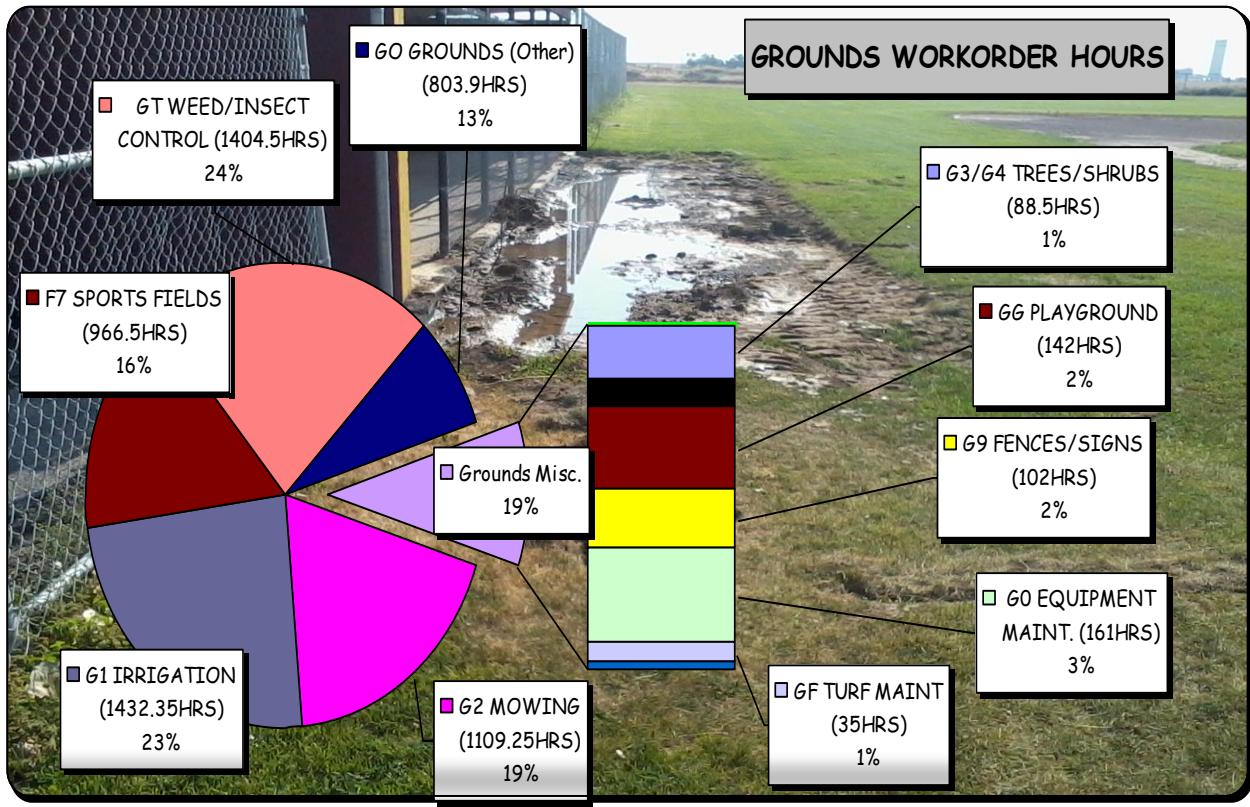


Grounds Program

We have 2.5 FTE's dedicated to this program. One specific to irrigation, one for sports fields, and a half at MLHS. At least 8 FTE's are added seasonally to sustain all the other categories of grounds work shown on the next slide.



Grounds Program



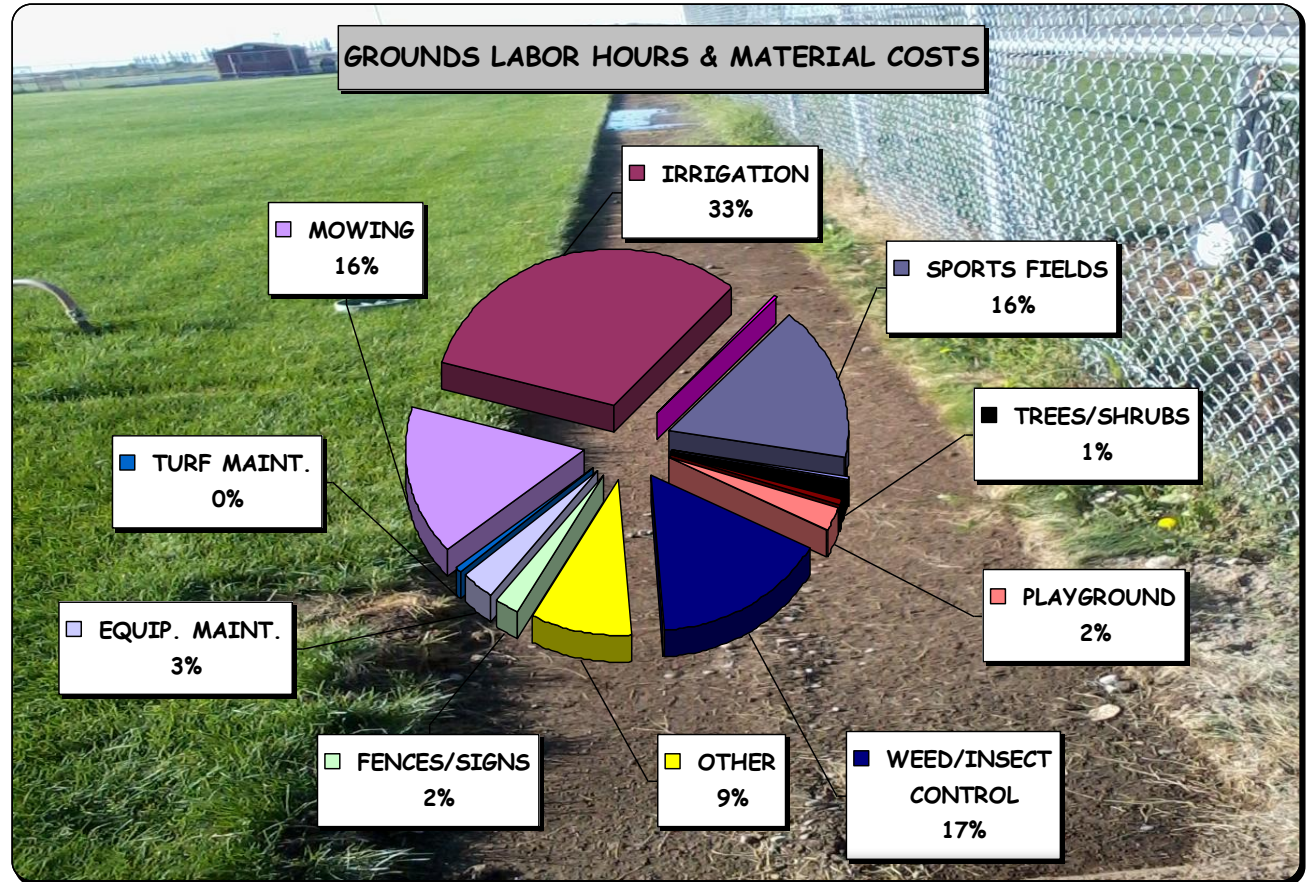
Some of our greatest challenges are; working around the constant usage of our facilities, maintaining our older equipment, and not having the resources to meet expectations



Grounds Program



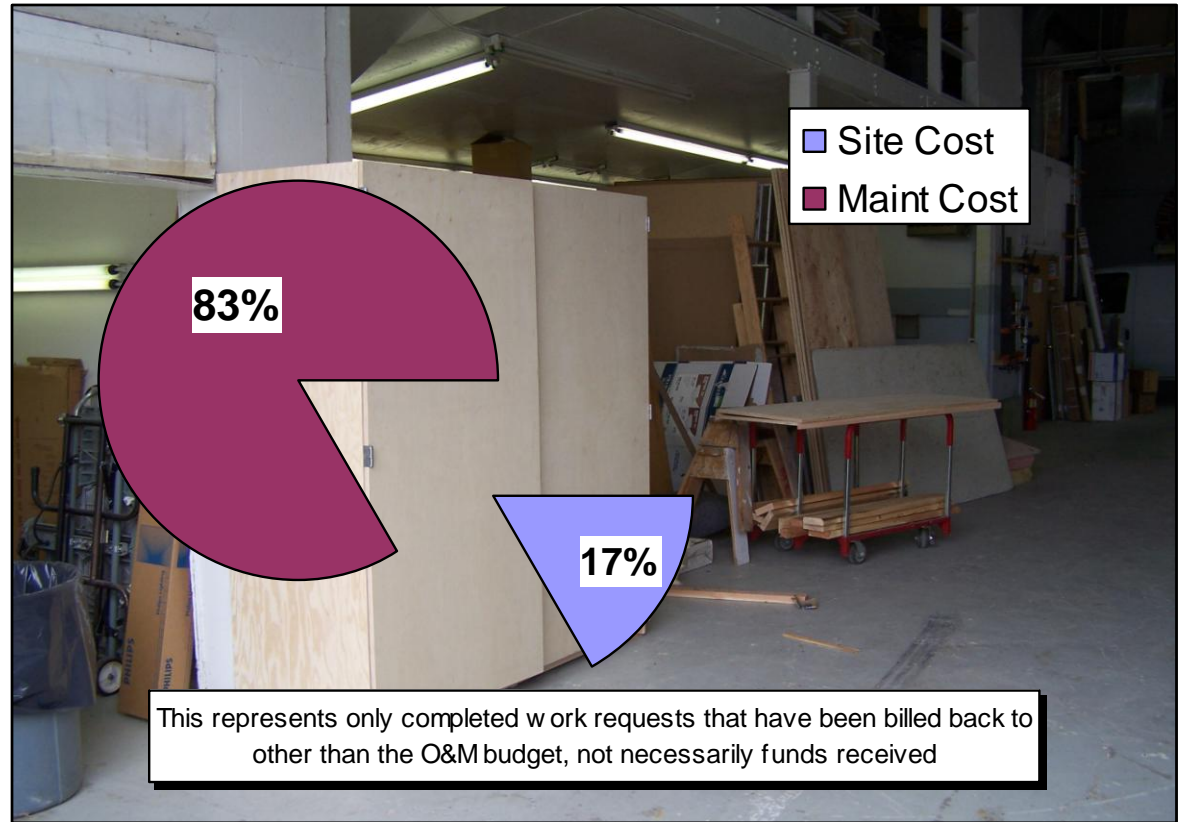
Irrigation tops the grounds categories at 33% of our resources with weed control gaining the # 2 spot this season at 17%. Mowing and sports field maintenance are tied at #3 with 11% each; leaving 28% for all the rest!





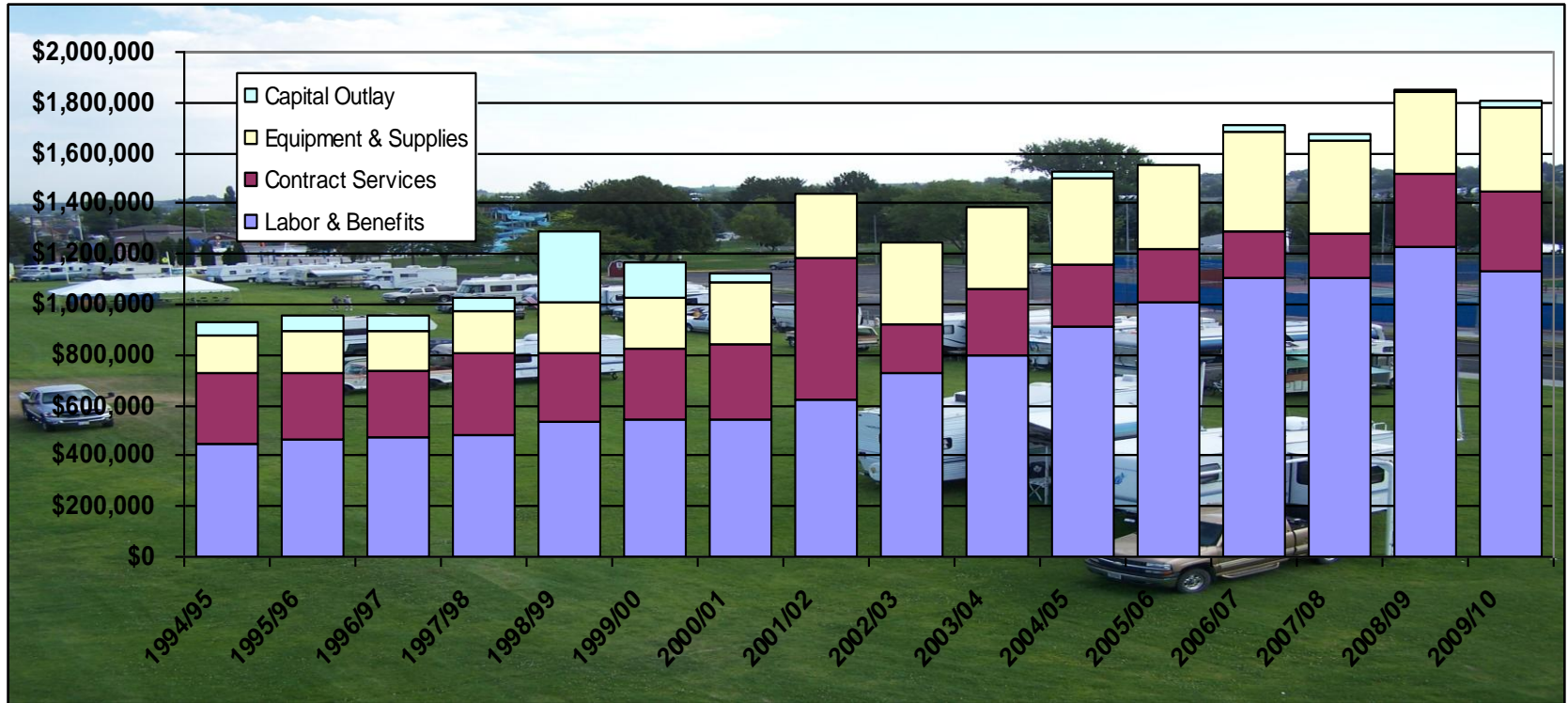
O & M costs Vrs. Site Funded

Work requests which do not involve repairing something are billed back to the requesting site or dept. budget ~ & may include labor costs to cover the hours regular employees are away from their maintenance tasks. Principals & Directors have the option to seek quotes from outside contractors or from the District's small works roster as well.



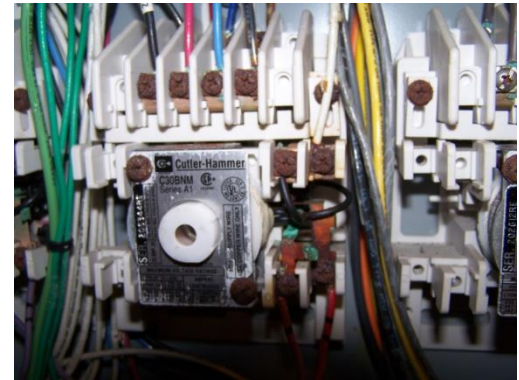
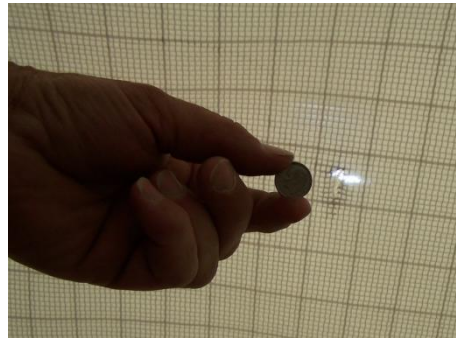
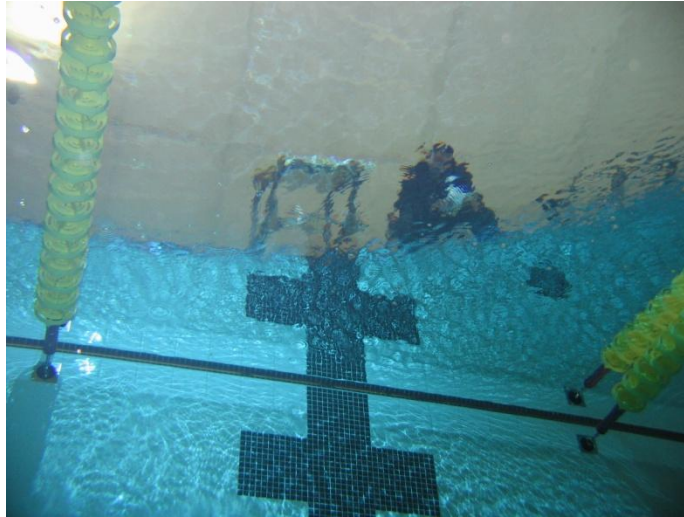


Expenditure Analysis History

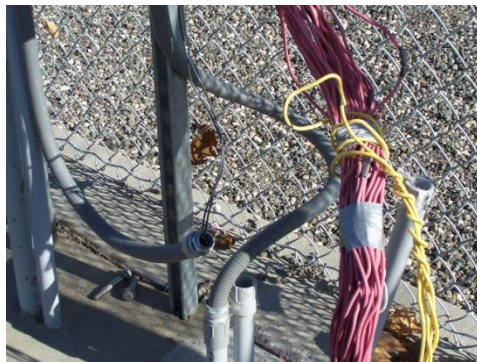
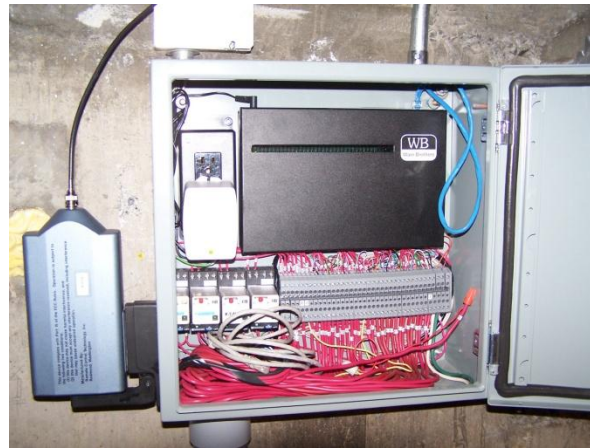
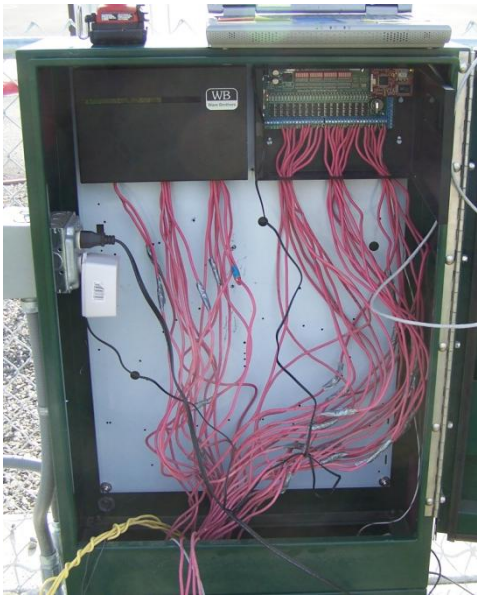


Trending the past 18 years; Labor & Benefits have doubled + \$600k, Contracted services have decreased by about half, Equipment & Supplied have doubled, while capital outlay for new & replacement equipment is virtually non existent at 1.38%

Maintenanceland



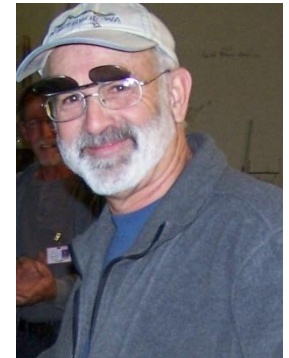
Maintenanceland



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Maintenanceland



Maintenanceland



Maintenanceland



Thanks for your Support!

Communicate and Document

Hello! On _____ we were in your room responding to Work Order request # _____ to _____.

If the work was not done to your satisfaction or you continue to experience problems, or have concerns - please contact our office immediately at ext.7402 or one of the alternates below. Thank You!



MOSES LAKE SCHOOL DISTRICT FACILITIES MAINTENANCE TEAM



2006
Children's Environmental Health
Recognition Award

Office Phone: 766.2683 Fax: 766.2684
Emergency: 750.4164
Email: workorder@mlsd.wednet.edu



≡ Successful Communication ≡

Preventing, Responding, & Solving IAQ Issues

Rich Prill

WSU Extension Energy Program

Fear

Odors

Chemicals

Mistrust

Asthma & Allergens

VOCs

IAQ

Molds

Combustion

Particles



Today's IAQ Challenges

Heightened awareness of IAQ

Increased occupant asthma & sensitivities

Health care costs

Break-down maintenance and older equipment and structures

Shrinking dollars & rising costs for facilities

Impacts from IAQ Problems

IAQ problems can wipe out savings from efficiency efforts

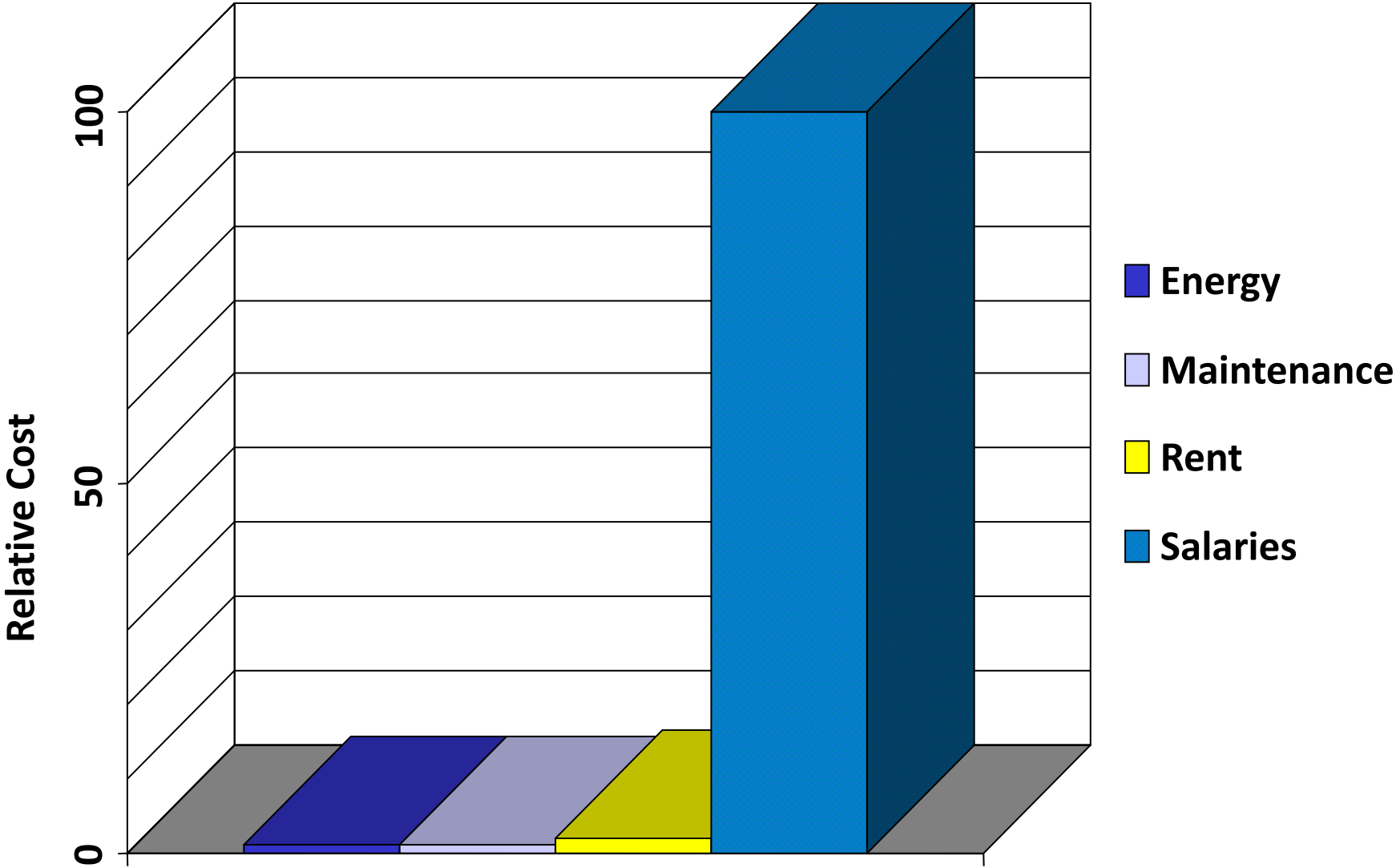
Money and time spent on investigations & solving IAQ problems impacts facilities resources

Sick building reputation can stick

Facilities staff get blamed



Comparative Costs



BOMA Study: Average US Office Building

“My School District doesn’t need IAQ Policies.... it will just raise the issue and cost us time and money”



What message does this send to occupants?

Concern

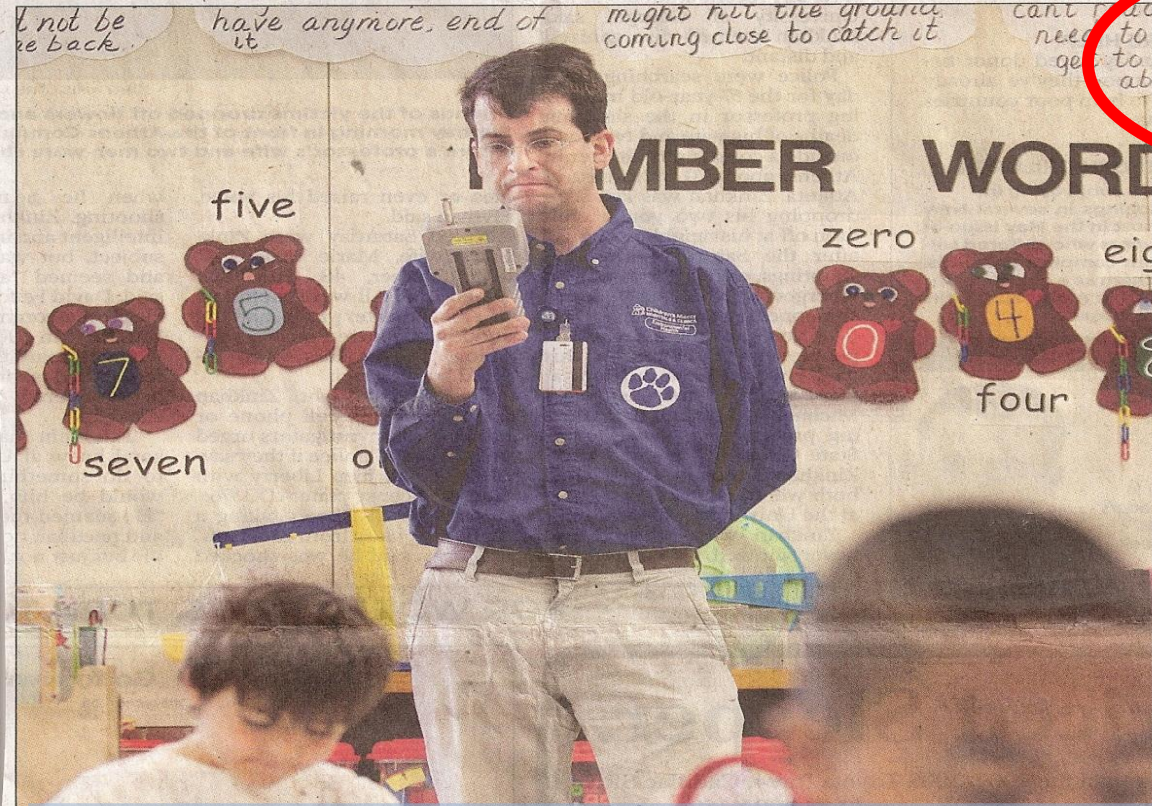
Respect

Compassion

Credibility

Break-down maintenance not appropriate for people

SCHOOLS FACE MOLD MYSTERY



Kansas City district has spent \$730,000 to fight problem, but teachers have been told little.

By JOE ROBERTSON
The Kansas City Star

The Kansas City School District has problems with mold and air contaminants, spending hundreds of thousands of dollars a year testing and cleaning some of its buildings.

But that's not what frustrates teachers the most.

It's how sparingly the district shares what it knows.

Teachers at Trailwoods Elementary School waited months before learning why their school was cleaned over the summer.

And teachers at Knotts Elementary still don't know the degree of air contamination that had them scrambling out of their school a week before classes started.

"The teachers wanted to know what was going on," said teachers

MORE LOCAL NEWS BEGINS ON A4

Jail remodeling will have Johnson County inmates on the move.

\$730,000 . . . and still a "mystery"

Teacher's union sued District for air quality report the District says is not a public document.

According to studies, occupants **do not** ***readily*** express ***dissatisfaction*** with IEQ

Communications are critical –

Find “Issues” before evolve into Problems”



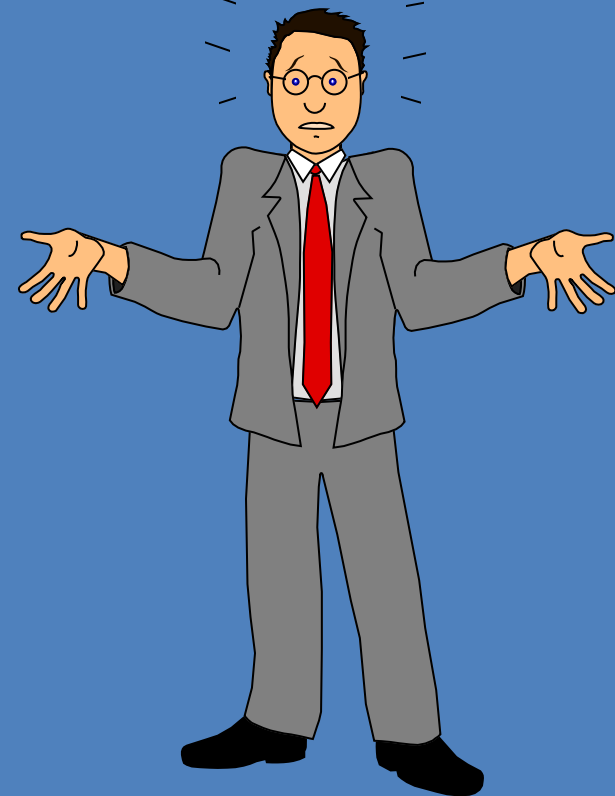
**Prove
that it's
NOT safe!**

**Prove
that it IS
safe!**





What are the options?
Our lawyers
against their lawyers?




THERE



WILL BE A

\$500 Charge
for Whining

Thursday

A photograph of a square air vent on a ceiling. A white piece of paper is taped to the ceiling, partially covering the vent. The word "HELP!" is written on the paper in red marker. The ceiling is made of acoustic tiles, and the vent has a concentric square design.

HELP!

"Message" from occupants



More "messages"







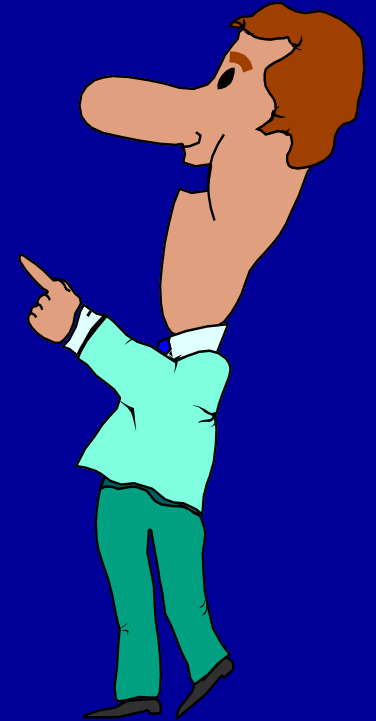
"Message" from occupants

Good luck reasoning with *"emotional"* people



**DISGRUNTLED EMPLOYEE
OF THE MONTH!**

Establish a non-threatening method for occupants to register concerns



A message from occupants !!!!

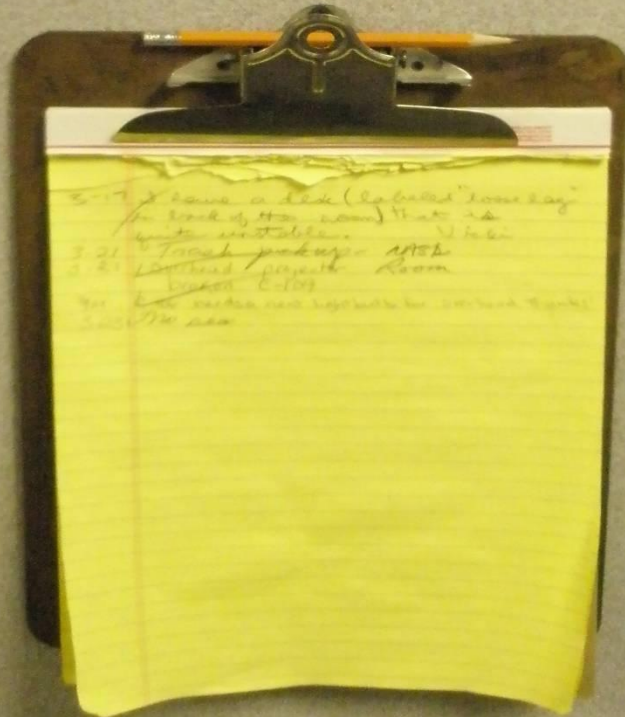
MR. OSBORN

MR. McCOOL

MRS. STATES

A101 MAINTENANCE

1 2 3 4 5 6 7 8 9 0



Reporting IAQ Concerns & Issues



Should be easy, non-threatening,
policy-driven and **effective**

Category	Key Questions
COMFORT	
C-1	<i>Overall Comfort</i>
C-2	<i>Temperature</i>
C-3	<i>Temperature Actions</i>
C-4	<i>Air Movement</i>
C-5	<i>Humidity</i>
C-6	<i>Comfort Actions</i>
ODOR	
O-1	<i>Odors</i>
NOISE	
N-1	<i>Noise Level</i>
N-2	<i>Noise Preference</i>
N-3	<i>Noise Type</i>
N-4	<i>Noise Impacts</i>
LIGHTING	
L-1	<i>Lighting Satisfaction</i>
L-2	<i>Lighting Problems</i>
L-3	<i>Lighting Impacts</i>
GENERAL	
GC-1	<i>Productivity</i>

Rated 2	Rated 1	Average Rating
		3.4
		3.5
		3.9
		4.2
		4.3
		3.9
		4.1
		3.6

-total = 3.9

Total Occupant Survey Score =

71

(maximum score = 100)

Issue or Concern Response



The clock is ticking

- Occupants getting *emotional*
- *Rumor mill* is working
- *Trust* is compromised
- Solutions becoming more *difficult & expensive*

Response WAY too slow



Quick Initial Response Necessary

Demonstrate you are 'on it'



"Issue" or "Concern"



Indoor Air Quality Complaint Form



This form can be filled out by the building occupant or by a member of the building staff.

Occupant Name: _____ Date: _____

Department/Location in Building: _____ Phone: _____

Completed by: _____ Title: _____ Phone: _____

This form should be used if your complaint may be related to indoor air quality. Indoor air quality problems include concerns with temperature control, ventilation, and air pollutants. Your observations can help to resolve the problem as quickly as possible. Please use the space below to describe the nature of the complaint and any potential causes.

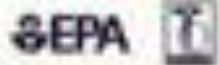


Get the "facts"

Immediate Interview

Building Air Quality

A Guide for Building Owners
and Facility Managers



Electronic Forms & Checklists

epa.gov

Gather more "facts"

Occupant Diary

Occupant Name: _____ Title: _____ Phone: _____

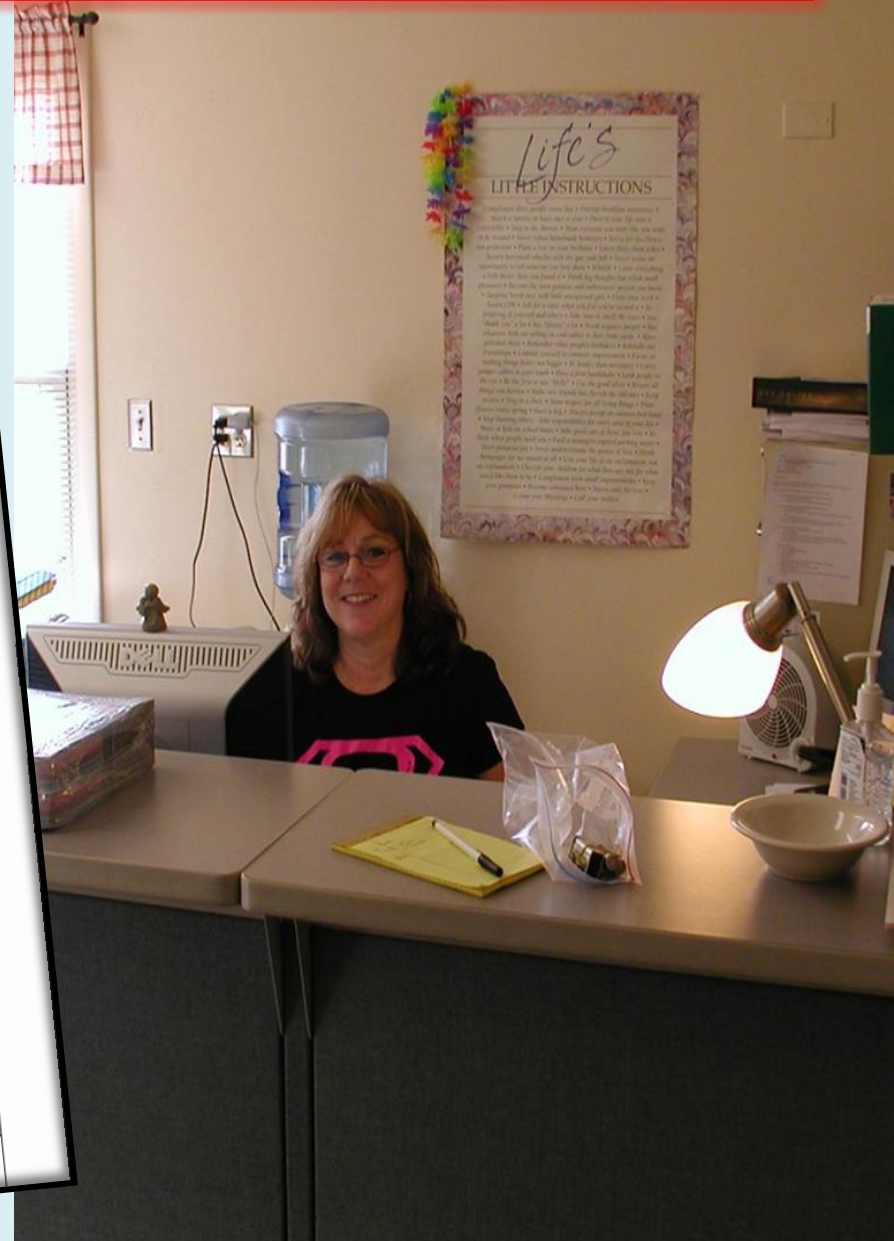
Location: _____ File Number: _____

On the form below, please record each occasion when you experience a symptom of ill-health or discomfort that you think may be linked to an environmental condition in this building.

It is important that you record the time and date and your location within the building as accurately as possible, because that will help to identify conditions (e.g., equipment operation) that may be associated with your problem. Also, please try to describe the severity of your symptoms (e.g., mild, severe) and their duration (the length of time that they persist). Any other observations that you think may help in identifying the cause of the problem should be noted in the "Comments" column. Feel free to attach additional pages or use more than one line for each event if you need more room to record your observations.

Section 6 discusses collecting and interpreting occupant information.

Time/Date	Location	Symptom	Severity/Duration	Comments
Monday	OK			
Tues morning		sneezing		
Wed AM		sneezing		
Wed PM		sneezing		
Thurs AM		sneezing		
Friday	OK			



Consider if the issue is actually
"Building Related" or unique to
the individual . . .

Environmental stressors include:
comfort
lighting and glare
noise
job stress



Occupant Interview

Building Name: _____ File Number: _____ Page 1 of 2
Address: _____
Occupant Name: _____ Work Location: _____
Completed by: _____ Title: _____ Date: _____

Sections 4 discusses collecting and interpreting information from occupants.

SYMPTOM PATTERNS
What kind of symptoms or discomfort are you experiencing?

Are you aware of other people with similar symptoms or concerns? Yes _____ No _____
If so, what are their names and locations? _____

Do you have any health conditions that may make you particularly susceptible to environmental problems?
 contact lenses chronic cardiovascular disease undergoing chemotherapy or radiation therapy
 allergies chronic respiratory disease immune system suppressed by disease or other causes
 chronic neurological problems

TIMING PATTERNS
When did your symptoms start?

When are they generally worst?

Immediate Interview

Page 1 of 2

Occupant Interview

Building Name: _____ File Number: _____
Address: _____ Work Location: _____
Occupant Name: _____ Title: _____ Date: _____
Completed by: _____

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Do you have any health conditions that may make you particularly susceptible to environmental problems?

<input type="checkbox"/> contact lenses	<input type="checkbox"/> chronic cardiovascular disease	<input type="checkbox"/> undergoing chemotherapy or radiation therapy
<input type="checkbox"/> allergies	<input type="checkbox"/> chronic respiratory disease	<input type="checkbox"/> immune system suppressed by disease or other causes
<input type="checkbox"/> chronic neurological problems		

TIMING PATTERNS

When did your symptoms start?

When are they generally worst?



- **WHO** is affected? How many?
- **WHAT** is the nature of the issue?
- **WHERE** does the problem occur?
- **WHEN** does the problem occur?

Health issues must be addressed with medical professionals

Document:
tests
medications (optional!)
recommendations

Page 1 of 2

Occupant Interview

Building Name: _____ File Number: _____
Address: _____ Work Location: _____
Occupant Name: _____ Title: _____ Date: _____
Completed by: _____

Sections 4 discusses collecting and interpreting information from occupants.

SYMPTOMPATTERNS

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If so, what are their names and locations? _____

Do you have any health conditions that may make you particularly susceptible to environmental problems?

- contact lenses
- chronic cardiovascular disease
- allergies
- chronic respiratory disease
- chronic neurological problems
- undergoing chemotherapy or radiation therapy
- immune system suppressed by disease or other causes

TIMING PATTERNS

When did your symptoms start?

When are they generally worst?



Share interview and agree on next steps *with all involved*

Inspect



Collaborating to find answers

Essential "Good Practices"

*Compare to common sense
benchmarks:*



Dry
Clean
Comfortable
Pollutants Controlled
Adequate Ventilation

"Show Me"





Inspections: involve key occupants

Take occupants on a guided tour

*Wow, they really are
doing their best!*



07174

PARTNO. 07174

PARTNO. 07174

PARTNO. 07174

PARTNO. 07174

07174



VENT
MET







1/4/2000 1:48pm





Communicate to learn:

***what* has changed,**

when, why, and impacts

Compare to “*baselines*”

Evaluate cleanliness



Did *particles increase*
or did *custodial decrease*?



Soot build-up in 1 hour !



New Combustion Equipment ?



Communicate Inspection Results

October 8, 2010

• Dan's Office

3,100 CO2

120 footcandles

filter by-passes

negative DP

• Mary & Jim's Office

650 CO2

81 degrees F

positive DP

- 1) *Rank Priorities*
- 2) *Set Timelines*
- 3) *Agree on Measureable Outcomes*
- 4) *Identify solutions*

Agree on Solutions

People are more likely to accept solutions they helped create!



Solutions must be collaborative

Try to agree on:

Investigation methods

Realistic timelines

Measurable outcomes



Measurable outcomes are essential

Use "Industry Standards"

Confirm or rule-out causes

Dial-in remediation

Verify solution effectiveness

Agree on measureable outcomes

- ✓ Comfort within guidelines
 - temperatures
 - relative humidity
 - air velocity
- ✓ Correct air flow direction
- ✓ Carbon dioxide (CO_2) \leq 1,000 ppm
- ✓ Reduced noise
- ✓ Reduced airborne particles

Measurable Reductions

Health Effects

Absenteeism

Medication use

Doctor visits

Irritation

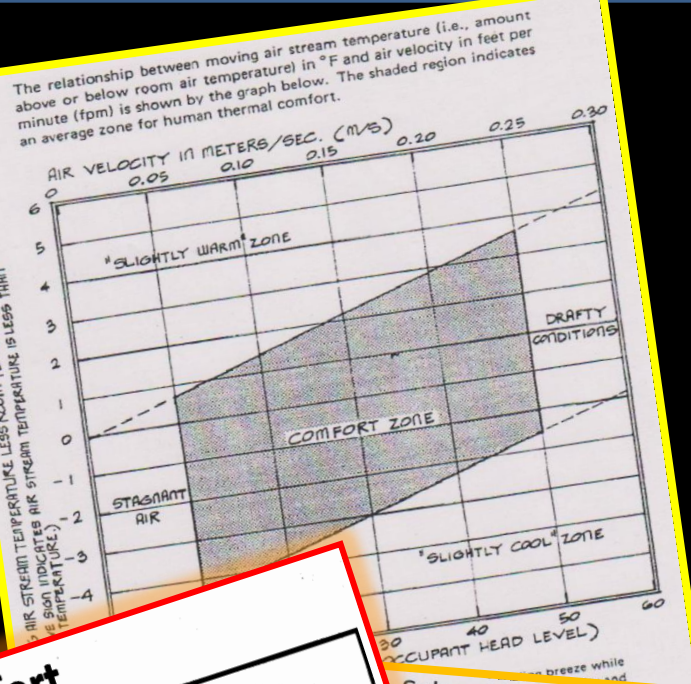
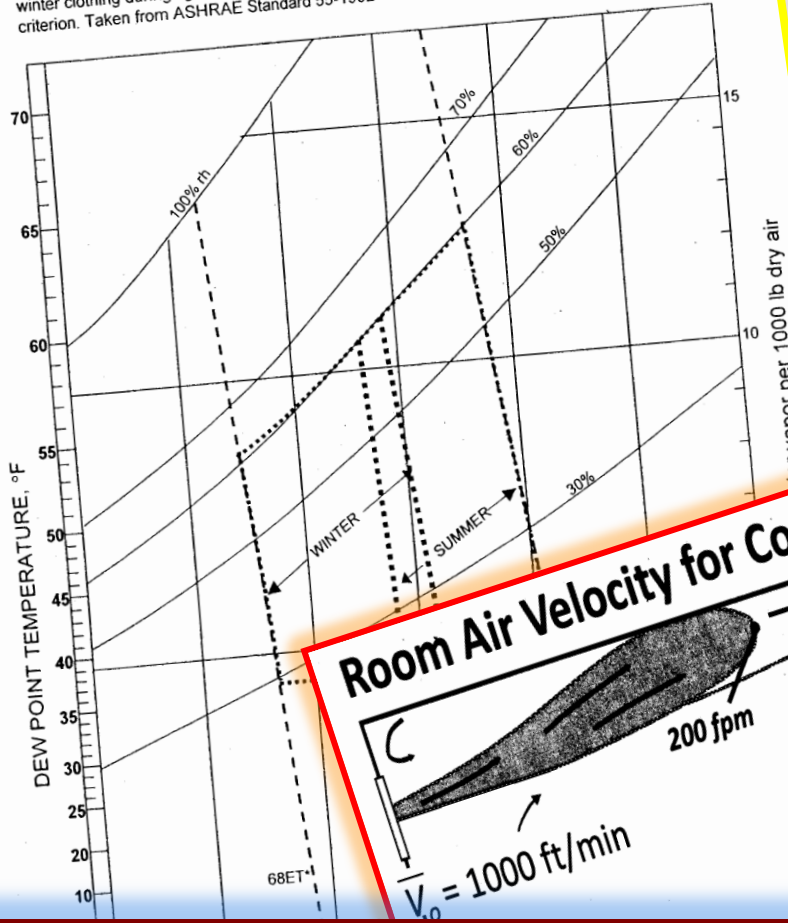
Distractions



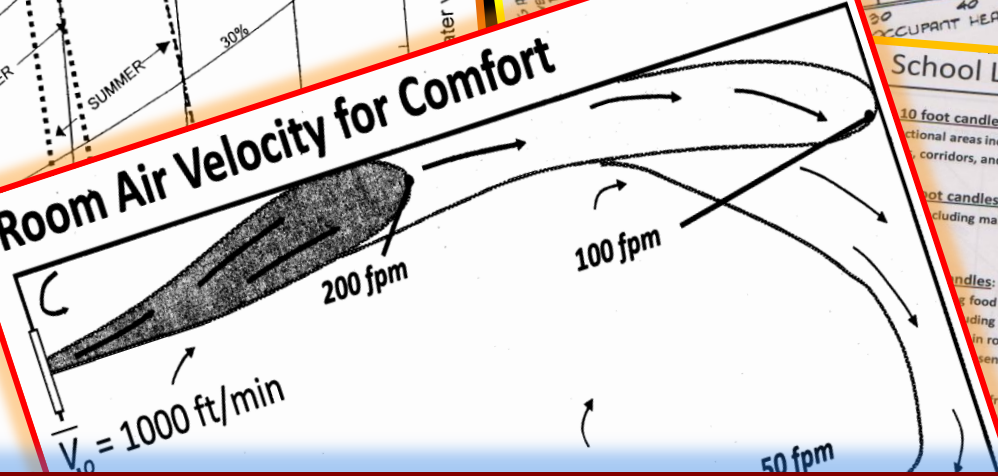
Communicate: Share measurement plans and results with all staff

Operative Temperature

Acceptable ranges of operative temperature and relative humidity for people in typical summer and winter clothing during light, primarily sedentary activity. The ranges are based on a 10% dissatisfaction criterion. Taken from ASHRAE Standard 55-1992



Room Air Velocity for Comfort



School Lighting Requirements

10 foot candles: from general, task, or natural lighting shall be provided in: instructional areas including auditoriums, lunchrooms, assembly areas, toilet and corridors, and stairs

5 foot candles: from general, task, or natural lighting shall be provided in: food storage and preparation rooms, study halls, lecture rooms, and libraries. rooms with computers, presentations.

3 foot candles: from general, task or natural lighting shall be provided in: sewing rooms, storage areas, drafting rooms

Provide Measurement "Benchmarks"

the path of egress the floor level auditorium (m system.)

tion or eye strain

other lighting

Measurements must yield useful answers

Dry

Clean

Comfortable

Pollutants

Ventilation

Moisture

Temperature

Air Direction

CO₂ iiii

Lighting

Acoustics

Particles

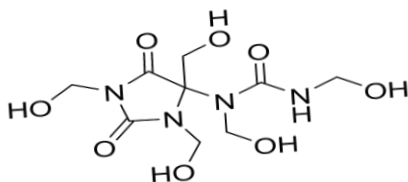
Carbon Monoxide

Don't Measure What You Can't *Reasonably Interpret*



Save your money for the rare episode that more practical methods can't explain

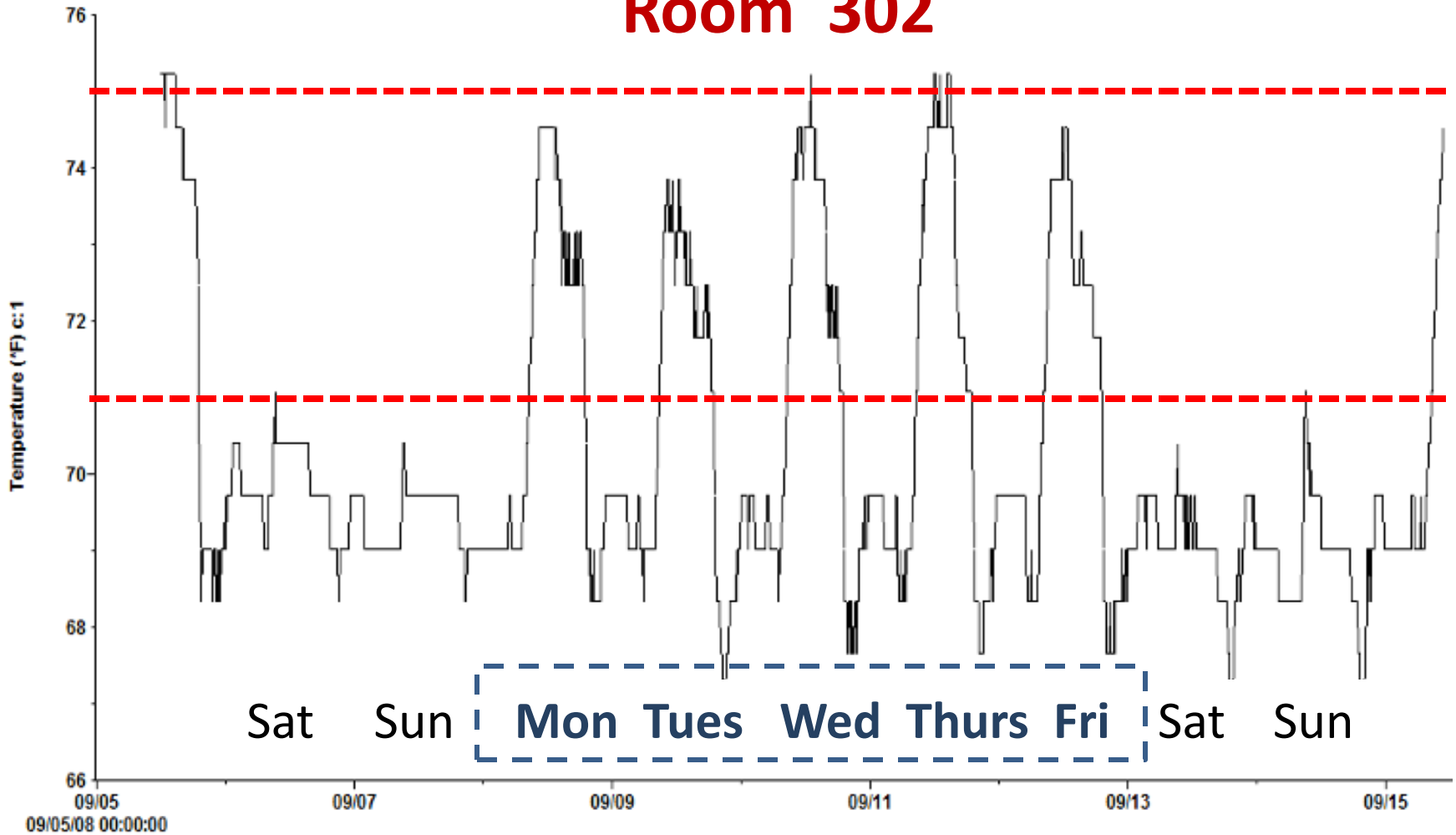
We Measure Anything And Everything

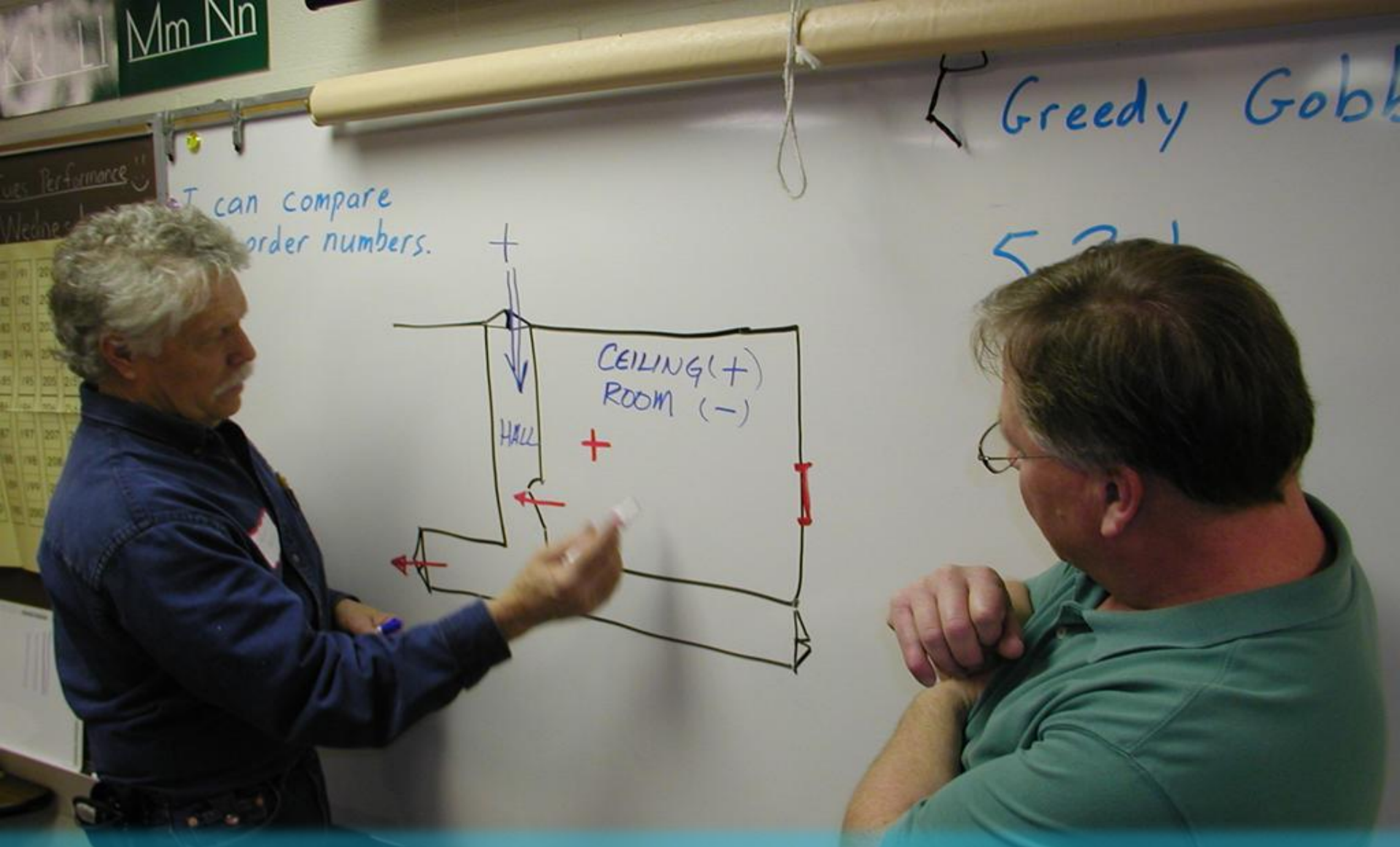


Data Loggers

"Picture worth a 1,000 words"

Room 302

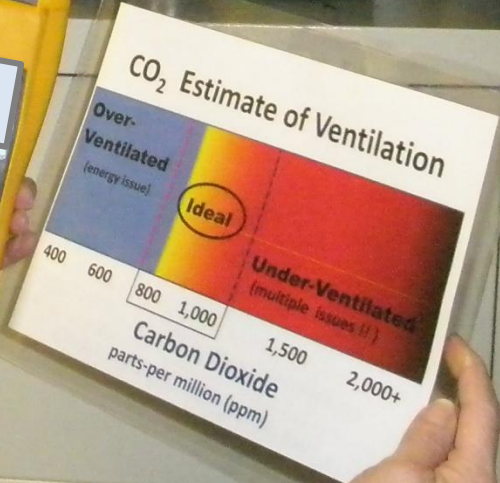




Mapping pressure relationships can lead to clues/sources of trouble



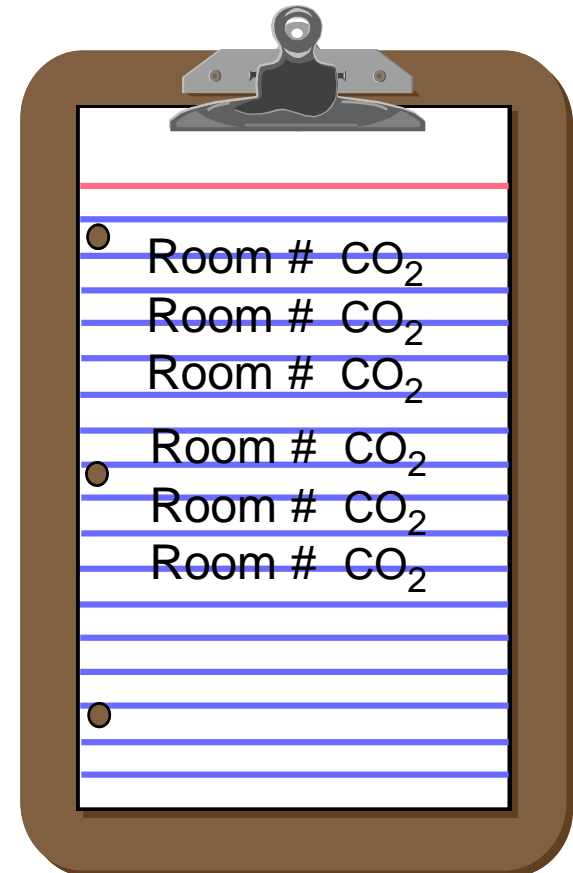
800



Explain the numbers

Immediate Feedback
post the measurement
results

CO₂
Temperatures
Relative humidity
HVAC on/off
Carbon Monoxide
Air Flow Directions
Particles





Post-issue resolution:
*Institutionalize prevention with policy,
action, and accountability*

A practical IAQ Program is essential:

- ✓ Promotes positive communication
- ✓ Establishes trust
- ✓ Sets boundaries on expectations



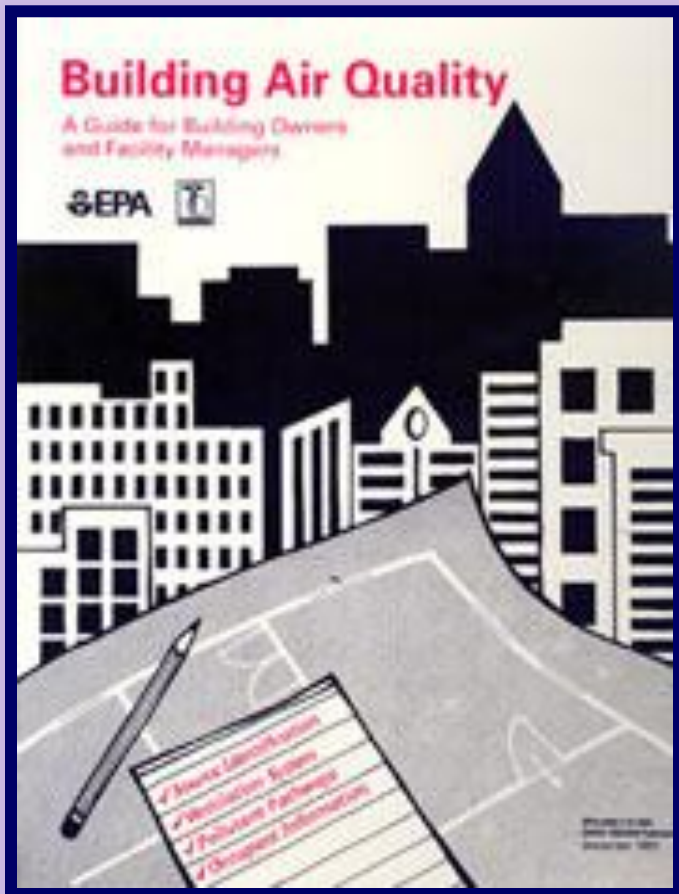
An IAQ Program supports facility staff efforts

Policies address
each building's
unique challenges

Established goals
helps assure
resources



Adopt a *practical and effective* IAQ Program



Public & commercial buildings

EPA Tools For Schools

WSU Virtual Walk-Through Video

Region 10 EPA 3-Step School IAQ Program



Create Your Own IAQ Program

Your program will likely be

Easier

More Effective

Less Expensive

Personally Rewarding

"It's understood there is a large silent majority of individuals that strive to create a better learning environment. Consider taking credit for indoor air quality efforts in your school...."

Rich Prill

Indoor Air Quality in Northwest Schools

An electronic newsletter for school Indoor Air Quality (IAQ) exclusively for Northwest schools.

Winter 2005

Continue to Provide Resources

2004 Tools for Schools Symposium Washington, DC, December 2004

Article by Rich Prill,
Washington State University Extension Energy Program

More than 500 people attended the 5th Annual Tools for Schools symposium this year. To say the symposium is a great place for networking

School Indoor Air Quality Newsletter for Northwest Schools

A quarterly electronic newsletter exclusively for Northwest schools.

Please circulate this subscription opportunity throughout the Northwest to those who may be interested.

There are two ways to subscribe:

- 1) To view the newsletter, click here: www.energy.wsu.edu/projects/building/iaq_nl.cfm

The newsletter contains a link for subscription information.

Policy and Actions include ...



Routine walk-through monitoring



Ensure facilities staff share accurate information

Publicize your IAQ efforts



BIRCHWOOD ELEMENTARY SCHOOL

INDOOR AIR QUALITY

APRIL 21, 2003

ACTIONS TAKEN BY BSD TO ADDRESS IAQ ISSUES:

Change Supply Air Filters Every Season

Use of Backpack Vacuums

1995, Replace Roof

Reduce use of chemicals/Install Automatic Mixing Stations

1996, Requested Health Departments help for IAQ

1997, Implementation of "Tools for Schools"

1998, Started using Unbleached Paper Products

1998, BSD initiated Annual Building Cleanliness Inspections

2000, Switched to using "Green" label products

2000, Replace windows in original building w/Insulated windows

2001, Replace windows in Office/Staff Break room

The sun is brighter, the air is fresher...
why?



Bob and Jim Cleaned filters!



Date: <u>12-28</u>	Time: <u>1:10</u>	Signature: <u>Bob</u>
Date: <u>3-5</u>	Time: <u>4:00</u>	Signature: <u>BB</u>
Date: _____	Time: _____	Signature: _____
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Promote your programs

Effective Communication:

Everyone Wins

Facilities

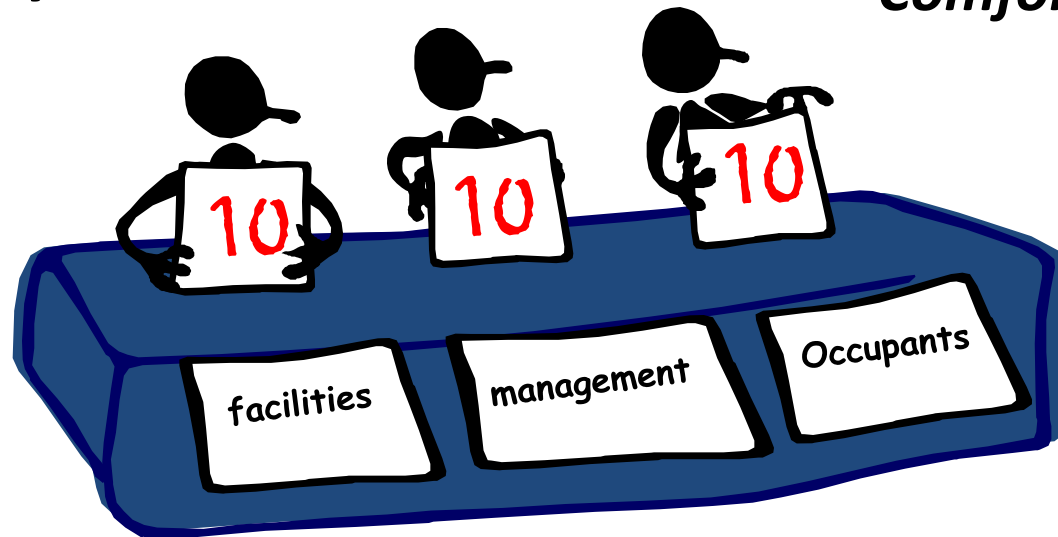
- *Saves time*
 - *Saves money*
 - *Job satisfaction*
 - *Allows energy & resource efficiency*
- focus*

Management

- *Satisfied clients*
- *Productivity*
- *Saves money*
- *Employee retention*

Occupants

- *Quality of life*
- *Improved health*
- *Productivity*
- *Comfort*



***Thank you
for your attention !***