Effort Needed to Improve the Capability of School Facility Maintenance Services

A report by the District Performance Auditor
March 2008

PORTLAND PUBLIC SCHOOLS
PORTLAND, OREGON

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SUMMARY

Effective and efficient building maintenance is a critical function for all public school districts. The mission of building maintenance is to provide a safe and clean environment for students and teachers, to protect the value of the building asset, and to contribute to better teaching and learning.

My review of building maintenance in the Portland Public Schools indicates that the Facility and Asset Management Division (FAM) currently faces a number of challenges that negatively affects the capability of the program to fulfill its maintenance mission. The major challenges facing the maintenance program include:

- Significant workload demands in the form of old buildings that need a significant amount of repair, renovation, and replacement
- Limited physical and financial resources to address this workload demand
- A demoralized and dissatisfied workforce
- Incomplete and inadequate maintenance management tools and practices to guide and support building maintenance efforts

Most of these conditions are the result of significant budget cuts over the past 15 years and the failure to adjust to a changed funding and staffing environment.

Despite these significant challenges, there is some reason for optimism that the capacity of the maintenance program may improve over the next few years. Specifically, the Facility and Asset Management Division is taking a number of actions to improve the management of building maintenance and to build a better partnership with the labor workforce. While these initiatives are not without critics, I believe that they are appropriate steps to control workload demand, to use resources more efficiently, and to manage organizational change.

Improvement efforts include:

- Establishing maintenance priorities to ensure that the most important tasks are performed at school buildings and that less valuable tasks are de-emphasized

- Increasing the amount of work performed by less-costly generalist labor while focusing specialist journeymen trades on tasks that require a license
- Creating a labor-management committee to address long-standing conflicts and to build a more cooperative working relationship

In addition to these and other efforts, I believe that FAM should consider additional actions that might help improve productivity, lower costs, and increase financial support. These actions include developing performance standards for routine maintenance tasks, developing a systematic process for comparing the cost of in-house and contracted maintenance services, and establishing mechanisms for more permanent, ongoing financial support for maintenance efforts.

In the long term, effective facility maintenance at PPS will depend on successfully implementing current reform efforts, reducing current workload demands, and enhancing the program's physical, financial, and human resources.

To help the Facility and Asset Management Division improve the capacity of the maintenance program to address its mission, I make a number of recommendations on page 33 of this report.

INTRODUCTION

Effective facility maintenance protects taxpayer investments in capital assets, ensures that students and teachers are safe and healthy, and contributes to improved teaching and learning. This report reviews the importance of school facilities maintenance, traces the history of school building maintenance at Portland Public Schools over the past decade, and evaluates the current capability of the PPS building maintenance function to address its mission. The report discusses recent initiatives to improve maintenance management and identifies additional opportunities to improve the operation of the maintenance program. A more detailed description of the report's objectives, scope, and methodology is presented on page 11.

The importance and value of building maintenance

An effective school facility maintenance function strives to achieve four primary goals:

- Provide a safe and healthy physical environment for teachers and students
- Protect and preserve taxpayer investments in public buildings and facilities
- Ensure buildings operate at peak efficiency and minimize energy and resource consumption
- Help support the teaching and learning mission of the district

According to *The Planning Guide for Maintaining School Facilities*[1] school building problems can negatively affect teaching and learning, student and staff health, day-to-

[1] *Planning Guide for Maintaining School Facilities*, School Facilities Task Force, National Forum on Education Statistics and the Association of School Business Officials International, February 2003

day building operations, and the long-range fiscal health of the entire educational organization.

According to the guide:

> "School facilities maintenance affects the physical, educational, and financial foundation of the school organization and should, therefore, be a focus of both its day-to-day operations and long-range management priorities."

The ***physical*** benefits of effective school maintenance help districts provide clean, orderly, and safe school buildings that are healthy and attractive environments to work and learn. Maintenance activities both help prevent problems from happening and provide fast response to routine repairs and emergencies that may impact school operations. Good maintenance can also contribute to more efficient use of energy and foster sound environmental practices in operating buildings.

In addition to the physical benefits to be derived from effective facilities maintenance, substantial ***financial*** enhancements can be realized through maximizing the life of new facilities and extending the life of old facilities. Organizations can avoid, reduce, and mitigate major capital expenditures by appropriately caring for buildings. The professional literature is replete with examples of squandered capital investments, deteriorated equipment, and invalidated warranties resulting from poorly managed maintenance programs. Moreover, the inability to take care of physical assets provided by tax resources can discourage future public investments.

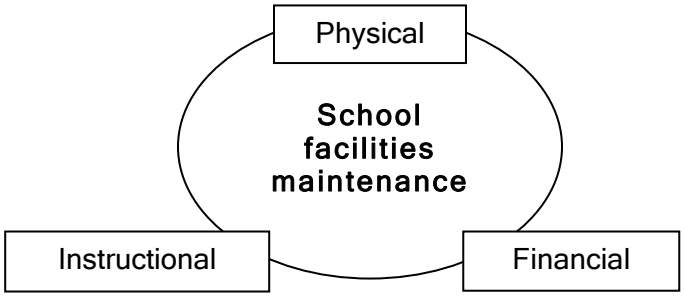
Ultimately, good facility maintenance can significantly contribute to the ***instructional*** effectiveness of school districts. A number of research studies suggest a strong link between the condition of buildings and community support and involvement.[2] One report concluded that old and obsolete buildings have negative consequences for the learning process while safe, modern, and controlled environments enhance the learning

[2] *Do School Facilities Really Impact a Child's Education?* J. Lyons Council of Educational Facility Planners International, November 2001

process.[3] Four recent studies have found higher test scores for students learning in better buildings and lower scores for students learning in substandard buildings.[4]

As illustrated in the diagram below, effective facility maintenance can have a positive affect on the physical, financial, and educational goals of school districts. While school maintenance programs strive to operate safe, clean, and healthy schools while optimizing the efficient use of financial resources, a physical setting that is appropriate and adequate for learning may be the most important outcome.

Benefits of effective school facility maintenance



A variety of factors can affect the condition of school buildings and facilities and therefore, the operation of facility maintenance programs and the achievement of the physical, financial, and educational benefits described above. For example, older buildings usually require more repair and replacement placing demands on operational and capital budgets. Extreme weather can affect the reliable operation of building components and the comfort of the school environment. Neglect, overuse, or vandalism can contribute to high operating costs and the inability to provide an adequate range of services and activities. Finally, funding limitations and the resultant deferral of needed maintenance efforts challenge effective facility maintenance.

[3] *The Impact of School Building Condition on Student Achievement and Behavior*, European Investment Bank presentation, Organization for Economic Coordination and Development, November 1998

[4] *Where Children Learn: Facility Conditions and Student Test Performance in Milwaukee Schools*, L. Morgan, Council of Educational Facility Planners International, December, 2000

The definition of facility maintenance

Industry literature on facility maintenance defines maintenance in a variety of ways. For the purposes of this report, the following definitions of the components of maintenance will be used:

- Preventive maintenance Planned and periodic inspection, adjustment, protection, and minor replacement of building system elements and components. The goal of preventive maintenance is to maximize the useful life of the physical asset and ensure optimal and efficient operations. Typical preventive maintenance tasks may include painting exterior walls and windows, lubricating and adjusting motors, replacing filters and cleaning drains, and testing alarms and security systems.

- Repair maintenance Unplanned repair of inoperative, deficient, or damaged building system elements and components to return the item to working order. Repair maintenance may be an emergency or routine in nature given the severity of the inoperative component and its impact on the health and safety of the occupants. A broken window shade might be routine but an inoperative boiler would be an emergency.

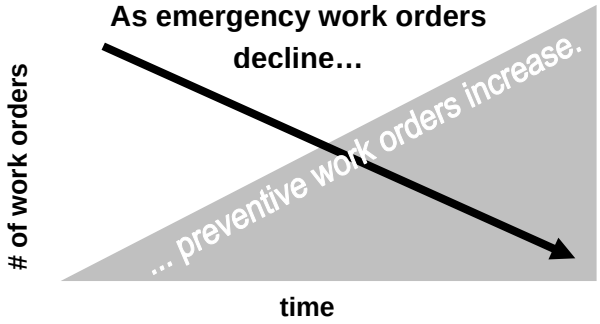
- Capital maintenance Replacement and renovation, both planned and unplanned, of major building system elements, components, and equipment. Given the size and nature of the replacement and renovation, capital maintenance may be performed by employees or by private contractors. Capital maintenance projects such as roof replacements or HVAC modernizations typically have a separate budget from other maintenance activities and are typically funded from general revenues or by borrowing through issuance of municipal bonds.

Professional writing on facility maintenance places great emphasis on the importance and necessity of conducting **preventive maintenance**. Effective preventive maintenance is viewed as a critical element in ensuring building components do not fail prematurely and operate at peak efficiency during their useful life. Preventive maintenance can spot deficiencies in equipment and systems before a failure that often requires additional resources to replace or repair. While deferring preventive maintenance may produce maintenance savings in the short-term, system failures cost more money in the long run and can significantly affect service delivery. Professional maintenance managers argue

that proactive maintenance is highly desirable both financially and educationally, and preventive maintenance hours should exceed hours spent on emergency repairs. [5]

The chart below demonstrates the desired relationship and goals for preventive versus emergency work orders.

Reactive versus proactive maintenance



The common categories of building components that need maintenance in most school districts include the following: the building envelope (roofs, walls, windows, doors, and floors), fixed equipment (HVAC, alarms, IT, security, kitchens), building infrastructure (plumbing, electrical) and grounds (turf, parking, paving, fields). The common skilled and unskilled construction trades that address these maintenance needs are listed below.

Maintenance trades	
Carpenters	Glaziers
Masons	Roofers
Steamfitters	Electronic Technicians
Plumbers	Grounds
Electricians	Machinists
Floorers	Music repair
Hardware	Sheetmetal
Painters	General labor

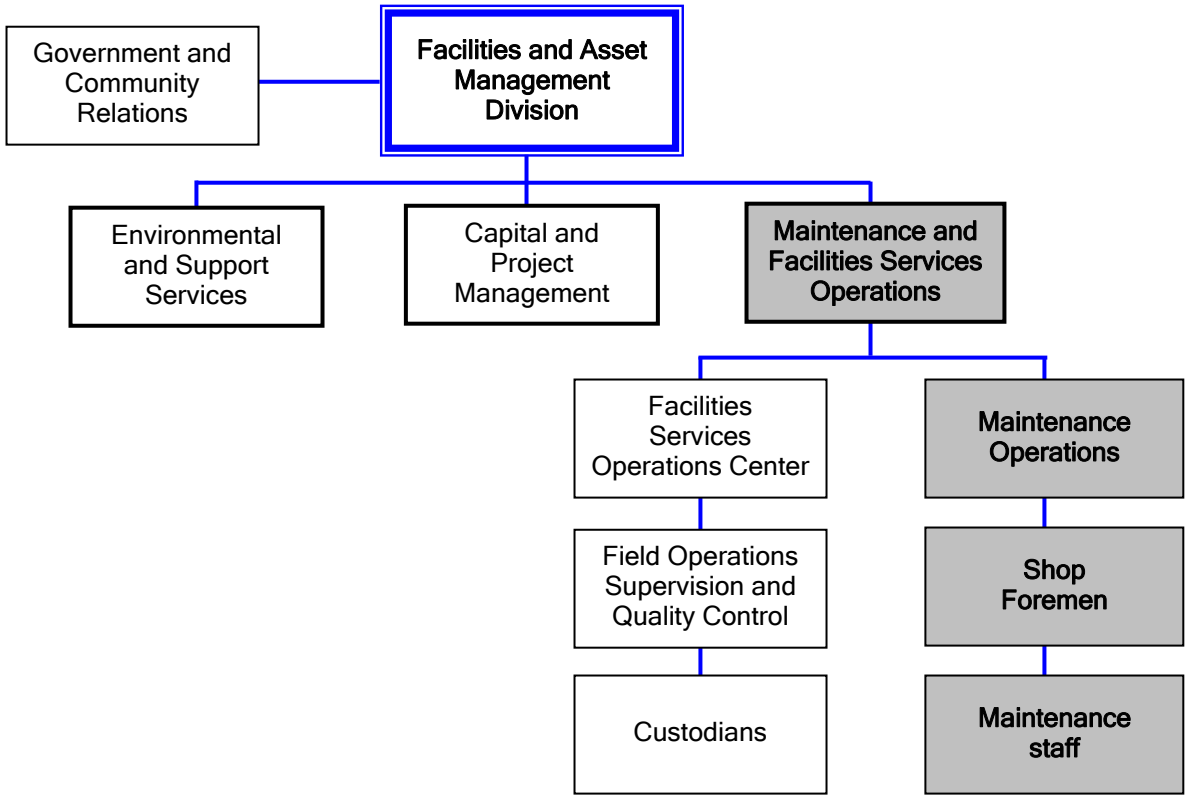
[5] *Planning Guide for Maintaining School Facilities*

Facility maintenance at Portland Public Schools

The Maintenance Services Department of the Facilities and Asset Management Division (FAM) conducts facilities maintenance at the Portland Public Schools. The FAM Division is one of several major central operating divisions reporting to PPS's Chief Operating Officer. In addition to maintenance responsibilities, FAM is also responsible for custodial services at schools and facilities, environmental management, building safety and regulatory compliance, property management and project management, and capital planning and development. The organizational chart below shows the current organizational structure of FAM and the Maintenance Department.

The Maintenance Services Department has a FY07-08 budget of $6.76 million and staffing of 75 full-time employees. Maintenance employees consist of one manager, 15 foremen, and 59 building trades employees. Maintenance staff are located centrally at the BESC facility and operate 15 trades shops located at the facility including electrical, steam-fitting, plumbing, electronics, and carpentry. As discussed on pages 18-19, maintenance shops are composed of over 60,000 square feet of shop space and workers use 102 vehicles and equipment of various sorts to conduct maintenance activities.

Organization Chart: Facilities and Asset Management Division



The Maintenance Department has responsibility for maintaining over 103 schools and other facilities. Of this number, 89 are active schools and alternative education centers, 6 are administration facilities, 3 are leased, and 5 are vacant. The 89 active schools include 29 elementary, 28 K-7/8, 14 middle, 10 high schools, and 8 alternative education centers. PPS school buildings and other facilities comprise 9.4 million square feet of space and 716 acres of grounds.

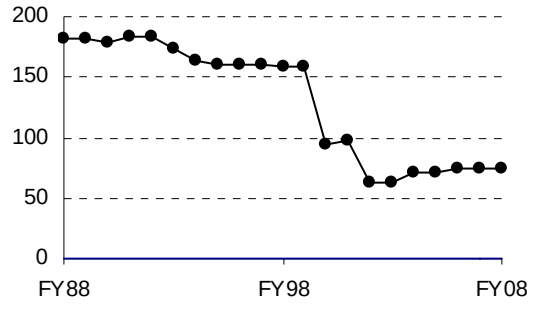
Appendix A is a complete list of all PPS schools and facilities, their use, age, and address.

PPS schools and facilities	
Elementary	29
K-7/8	28
Middle	14
High Schools	10
Alternative Education	8
Administrative	6
Leased	3
Vacant	5
TOTAL	**103**

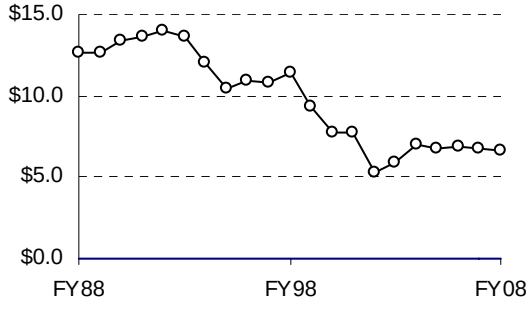
History of the maintenance services budget

As illustrated in the graphs below, the maintenance services budget of the FAM department declined significantly over the 20-year period from FY1987-88 to FY 2007-08. The number of full-time equivalent position supported by the general fund dropped from 181 positions in FY87-88 to 74 positions in FY07-08, a 60% reduction in maintenance staff. The maintenance services budget declined from $12.7 million to $6.8 million, a decline of almost 50%.

PPS Maintenance: Full-time FTEs



PPS Maintenance: Budget (in millions)



Source: FAM Budget

The primary factors contributing to decline in maintenance services budget and staffing were two statewide property tax limitation measures in 1990 and 1996 and lower State funding due to declining student enrollment. An additional factor contributing to the decline in maintenance funding was the desire by the district to reduce the level of overall Operations and Maintenance spending in comparison to other school districts.

As a result of these budget reductions, the maintenance services program discontinued a number of activities traditionally performed by the program and reduced standard service levels in a variety of areas. For example, the maintenance program discontinued the repair of athletic equipment, game floor and running track striping, and the inspection and repair of most kitchen equipment and cafeteria tables. In addition, the program reduced the amount and level of preventive maintenance such as corrosion control of heating and cooling systems, electric motors and controllers, and air handlers and exhaust fans. The maintenance of trees, shrubs, and other grounds was also significantly reduced.

In 1995, voters approved $197 million in General Obligation bonds to finance a number of building and facility improvements including seismic, fire, and life safety projects, major building repairs, and technology upgrades. Bond funds were largely spent by 2005.

Audit objectives, scope, and methods

This audit had four primary objectives as follows:

- To identify the value and importance of effective and efficient school building maintenance and repair
- To identify and evaluate the budgetary and operational changes in the PPS building maintenance program over the past fifteen years
- To evaluate the current capacity of the PPS maintenance program to address maintenance needs and to meet goals and objectives
- To identify opportunities to improve the performance of PPS building maintenance and repair services

To address these objectives I reviewed professional literature and research on school facilities management and maintenance, interviewed PPS management and employees in the Facilities and Asset Management Division (FAM), collected internal data on FAM maintenance program operations, budget, and finances, and toured schools to observe maintenance conditions. I compared FAM maintenance practices to a set of national best practices for school building maintenance. In addition, I surveyed five other similar school districts to obtain comparable information on their maintenance programs and obtained national benchmark data from the American School and University Magazine and the Council for Great City Schools. I also obtained historical data on maintenance program staffing and budgeting from FY87-88 through FY07-08.

I limited my review to the operations of the building maintenance program of the Facilities and Asset Management Division. The scope of my review did not include several important functions that are critical to operation of PPS schools and facilities including custodial services, environmental and business support services, capital and project management services, and property management.

This audit was conducted in accordance with my 2007 Audit Plan approved by the Finance, Audit, and Operations Committee of the Portland School Board. It was performed during the months of September, October, November, and December of 2007. I conducted this audit in accordance with generally accepted government auditing standards. Those standards require that I plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for my findings and conclusions based on my audit objectives. I believe that the evidence obtained provides a reasonable basis for my findings and conclusions based on my audit objectives.

AUDIT RESULTS

The PPS facility maintenance department currently faces a number of challenges that affect its ability to conduct an effective and efficient maintenance program. These challenges include high workload demands, old buildings and equipment, a demoralized work staff, and incomplete management systems and practices. Most of these conditions are the result of significant budget cuts over the past 15 years and the failure to adjust to a changed staffing and funding environment. The Facilities and Asset Management Division has recently begun to take action on several fronts to clarify work priorities, improve labor and management communications, and develop a new approach to facility maintenance at PPS. FAM should also consider implementing other practices that may help provide better tools to plan and manage maintenance activities.

High workload demands: significant number of old facilities in poor condition

The capacity of PPS maintenance program to effectively and efficiently provide services is in part affected by the level of workload demands placed on the organization. I found that the workload of the PPS facility maintenance program is relatively high when compared to national averages and to comparably sized school districts.

As shown in the table below, the square footage of buildings maintained per maintenance worker is 125,574 square feet in PPS compared to an average of 86,194 square feet for districts participating in the American School and University (AS&U) magazine survey and an average of 86,596 square feet for the five districts I surveyed. In addition, with the exception of San Francisco, PPS maintenance workers maintain more schools per worker than other school districts I surveyed, 1.37 schools versus an average of 1.17 schools. PPS also appears to have a higher number of work orders per worker than other school districts.

Maintenance workload demands: Other districts and Portland

	Sq ft per worker	Buildings per worker	Work orders per worker
Minneapolis	63,235	.7	153
Denver	112,008	1.19	208
Beaverton	76,556	.96	292
San Francisco	102,272	1.83	266
Seattle	78,907	1.18	237
AVERAGE	*86,596*	*1.17*	*231*
AS&U survey	86,194	-	-
PORTLAND	**125,574 sq ft**	**1.37 buildings**	**274 work orders**

Source: Auditor survey of school districts; FAM operational and budget statistics; *AS&U Magazine* "2006-07 Annual Maintenance and Operations Cost Study"

The age of facilities also affects the amount of maintenance work required because as building systems and components age they fail more frequently. PPS schools are considerably older than other districts around the country. A recent survey of 33 districts by the Council of Great City Schools found that 35% of the schools maintained by these districts were over 50 years old. In the PPS district about 82% of all schools are over 50 years old. A 1999 study from the National Center for Education Statistics (NCES) found that the average age of the main instructional buildings in public schools in 1999 was 40 years. This compares to an average of 67 years in Portland. As shown in the table below, the average age of schools for the five districts I surveyed was 45.5 years.

Average age of schools: Other districts and Portland

	Average building age
Minneapolis	-
Seattle	40
Beaverton	43
Denver	49
San Francisco	50
AVERAGE	*45.5*
NCES average	40
PORTLAND	**67 years**

Source: Auditor survey; National Center for Educational Statistics

PPS buildings are not only older than average but they are also in poor condition. In a recent study performed for the district, Magellan Consulting found that nearly all of the 103 schools campuses and facilities need some level of renovation or replacement. The consultants estimate that the average facility condition index rating for PPS schools is 41.5% – meaning that the estimated cost of repairs will approach almost half of the current replacement value of PPS schools and facilities. Twenty-three of the 103 schools and facilities have facility condition indexes (FCI) over 60%. Industry literature suggests that when FCI values exceed 60%, complete replacement might be preferable to major renovation. The table below illustrates the total cost of improving facility deficiencies by school category and other facilities.

Total estimated current renovation costs (2007) *

Facility category and number		
Elementary schools	29	$243 million
K8 schools	28	$285 million
Middle schools	14	$167 million
High schools	10	$330 million
Other facilities	22	$106 million
Total	**103**	**$1,131 million**

* An additional $53 million is estimated to be needed over the next five years to replace building components that will exceed their useful lives.

Source: Magellan Consulting, February 2008

Much of the needed improvements include building components at the end of their life span such as roofing, mechanical equipment, and electrical facilities. These same components require frequent repair by maintenance staff to ensure they are safe and working appropriately. Other needs include repair and renovation to ensure compliance with federal, state, and local laws and regulations, and actions needed to address building functional deficiencies and to improve the educational adequacy of schools. Estimates also include new construction for gyms and covered play areas. The table below summarizes the major renovation needs by category of renovation.

PPS facility renovation needs

Renovation category	
Deferred maintenance	$153 million
Code compliance	$76 million
ADA compliance	$59 million
Hazardous material	$56 million
Capital renewal	$547 million
Functional deficiency	$111 million
Educational adequacy	$104 million
New construction	$25 million
TOTAL	**$1,131 million**

Source: Magellan Consulting, February 2008

The number of building components needing repair and replacement has a significant impact on the type and amount of maintenance work conducted by FAM maintenance staff. According to maintenance managers, workers must spend more time on emergency and routine repairs and less time on preventive maintenance due to the age and condition of PPS buildings. While some preventive maintenance is still conducted in order to comply with safety regulations, significant time is spent repairing broken and failed components. The table below shows that the number of Emergency and Priority work orders has increased steadily over the past six years while the number of preventive work orders declined.

Number of work orders by priority

	2001	2002	2003	2004	2005	2006	2007 *
Emergency	4,696	4,968	5,618	5,646	5,750	5,440	4,288
Priority	2,756	2,883	4,076	4,766	4,541	5,055	5,227
Requested	5,918	4,485	5,600	5,472	5,392	6,252	5,814
Compliance	384	523	423	408	451	321	244
Preventive	3,396	2,887	2,725	2,451	2,312	2,325	25 *
Capital request	1,908	1,572	1,019	837	989	925	883

* Preventive and other work orders declined in 2007 due to changes in methods and practices for creating, categorizing, and closing work orders.

Source: FAM analyst

Resource challenges: physical, financial, and human

The capability of the PPS facilities maintenance program to perform well is also dependent on the physical, financial, and human resources available to provide maintenance services. My analysis indicates that while FAM's overall operating costs appear similar to other districts surveyed, FAM's maintenance program faces significant challenges in the form of old equipment and vehicles, inadequate ongoing capital and major maintenance funding, and a dissatisfied, demoralized maintenance workforce. The sections that follow provide a brief description of these conditions.

Operations and Maintenance costs appear average. Compared to surveys by the American School and University Magazine and the Council of Great City Schools, and my survey of similar districts, the Operations and Maintenance (O&M) expenditures at PPS appear close to average. The table below shows that the O&M cost per square foot in PPS is generally lower than other districts surveyed. O&M cost per student at PPS is higher than other Oregon districts but lower than other surveyed districts. O&M spending as a percent of the General Fund appears about average.

Operations and Maintenance expenditure comparisons [*]

2006-2007

	Expenditure per sq ft	Expenditure per student	O&M budget as % of General Fund
Minneapolis	$8.37	$1,946	-
Denver	$3.82	$741	-
Beaverton	$5.80	$666	-
San Francisco	$4.05	$686	-
Seattle	$4.78	$850	-
AVERAGE	*$5.36*	*$978*	-
*N*CES average	$3.22	-	10.4%
AS&U average	$5.09	$824	9.2%
Oregon district average[**]	$5.15	$640	8.9%
PORTLAND	**$4.03**	**$820**	**9.4%**

[*] Operations and Maintenance expenditures include maintenance, utilities, custodians, and supplies and services. O & M excludes capital and debt-related spending.

[**] Average is for the 6 largest Oregon districts

Source: Auditor survey; *AS&U Magazine*; National Council of Great City Schools ODE DBI reports

According to FAM management, the lower cost per square foot and the higher cost per student in Portland are due to several factors including older schools with more unusable space, declining enrollments, and fewer maintenance personnel. The higher than average O&M cost per student in Portland was a major concern several years ago and contributed to the belief that O&M costs should be reduced in order to free additional resources for the instructional program. While PPS O&M cost per student still appear to be slightly higher than average, cost per square foot and spending levels appear lower than average when compared to national surveys.

Aged vehicles and old equipment. The maintenance program uses approximately 102 pieces of major equipment and vehicles to provide services to schools and facilities. Major equipment includes flat-bed and dump trucks, a sweeper truck, bucket trucks, and various trailers to haul equipment. Most of the equipment is comprised of various types of vans used by trades to travel to schools and facilities to provide services.

As shown in the table below, 64 pieces of equipment or 63% of the total are over 15 years old, with some trucks and vans over 30 years old. Seventy pieces of maintenance equipment or 69% of the total have mileage over 50,000 miles and 16 vehicles have over 100,000 miles. According to maintenance managers, most of the trucks and vans are past their useful life and require significant annual costs to repair.

Maintenance equipment age and mileage

	Number	Percent
AGE:		
Over 15 years old	64	63%
MILEAGE:		
Over 50,000 miles	70	69%
Over 100,000 miles	16	16%

Source: PPS Maintenance Equipment 2006

Based on interviews with managers and supervisors, work crews generally are able to obtain adequate tools and supplies to perform maintenance work. However, given the age of many buildings and their components (lighting, boilers, electrical, etc.), certain parts and elements are difficult to find from supply vendors. Therefore, several FAM maintenance shops retain supplies of various parts and equipment they believe are needed to repair and replace failed components.

As discussed in the Introduction, the size of the maintenance workforce and scope of their maintenance responsibilities has been significantly reduced over the past fifteen years. Consequently, there is significant unutilized space in the various maintenance trade shops in BESC building. While FAM has not performed a detailed space utilization study to analyze the amount of needed and under-used shop space, several managers estimate that up to 30% of the 60,800 square feet of shop area may not be currently needed by the various shop trades. Several foreman argue that this space is still needed to store needed supplies and to respond to potential increase in staffing levels. FAM management has recognized the need to use space better and to reduce surplus and unneeded equipment and has begun reducing the size of shops and discarding and selling old equipment.

Lack of capital maintenance funding. Over the past several years, the PPS facilities maintenance function has had limited funding for capital maintenance. Capital funding is used for replacement and major renovation of building components due to planned and unplanned obsolescence such as roofs, boilers, and electrical systems. As shown below, over the past four years approximately $43.5 million in capital funding was available from the $197 million 1995 school bond levy that is now completely expended.

However, in the past two years, only $3 million in general fund resources was budgeted for capital maintenance projects. According to management, over half of this amount was dedicated to costs associated with the remodeling of schools for the K-8 reconfiguration.

Capital spending (in millions)

	FY03-04	FY04-05	FY05-06	FY06-07	FY07-08 **
Bond	$22.0	$12.6	$ 6.6	$2.3	-
General Fund	.9	1.4	2.8	3.0	3.0
Other*	.4	.7	.9	.8	.1
TOTAL	**$23.3**	**$14.7**	**$10.3**	**$6.1**	**$3.1**

* State energy funds, federal, state, and private grants, and other district funds.

** Partial year

This level of capital maintenance funding does not recognize the full cost of ownership of PPS facility assets and does not adequately support appropriate maintenance activities. In a 1996 report by the National Academy of Sciences entitled *Budgeting for Facilities Maintenance and Repair Activities*, the authors found that under-

funding of public building maintenance and repair was a widespread problem in the country affecting public health and safety and reducing the productivity of public employees. The report recommended that an appropriate budget allocation for routine maintenance and repair for an organization with substantial inventory of facilities should be from *2 to 4 percent of the aggregate current replacement value of the facilities*.[6] Applying this formula to the $2.8 billion current replacement value of PPS facilities would indicate that annual maintenance and repair should be budgeted in a range from $56 to $112 million annually. The annual operating budget for PPS Operations and Maintenance has averaged about $33.2 million the past five years and general fund support for capital improvement has averaged $2.2 million.

Given the financial realities of most government organizations and the specific funding pressures faced by public schools in Oregon, the level of funding recommended by the National Academy of Science has not been feasible or realistic. However, it does point to the significant mismatch between what is a desirable goal and the actual support received at PPS. According to FAM management, the significant renovation need is currently illustrated in the recent study of PPS facility condition and the estimated cost of replacement and repairs of over $1 billion. Management believes that one of the major benefits of the current Magellan Consulting study will be the development of a comprehensive assessment of facility conditions that can be used as a basis for a systematic approach to facility planning efforts.

Dissatisfied and demoralized maintenance workforce. My interviews with the foremen representing the 15 union trades providing maintenance services to the district revealed a high level of anger and dissatisfaction with PPS management and the current condition of the maintenance program. Much of the anger and frustration stems from the significant reductions in maintenance program funding and staffing that occurred over the past twenty years. Foremen believe that these reductions significantly compromised the quality of school maintenance and the condition of school buildings. Most foremen believe that they are unable to conduct preventive maintenance and cannot keep pace with the number of emergency and routine repair requests they receive each year.

It is difficult to determine if the dissatisfaction of the maintenance workforce has an impact on maintenance quality and productivity. As shown below, the amount of work

[6] *Budgeting and Facilities Maintenance and Repair Activities* - Report Number 131, 1996, National Academy of Sciences

performed measured in work orders completed by each of the union trade shops has remained relatively constant over the past five years, increasing by 2% from 2001 to 2006. However, in calendar year 2007 the number of work orders completed dropped 22% from the prior year. FAM officials believe this decline is due to various changes in the methods and practices for creating and closing work orders rather than a drop in productivity. For example, preventive work orders are no longer created as they were in prior years and rover crews may be completing work that previously was documented and performed by work order. Certain shops such as steamfitters and electricians have increased work order production while other shops such as electronics have decreased work orders completion. Some shops have declined due to changes in staffing levels.

Number of work orders by trade each year

	2001	2002	2003	2004	2005	2006	2007
Carpenters	1,178	587	551	538	496	508	496
Electricians	2,700	2,632	2,832	2,902	3,073	3,214	2,850
Electronics	1,817	1,500	1,596	1,499	1,445	1,351	770
Floors	308	146	271	306	230	285	313
Glaziers	889	781	948	879	958	995	869
Grounds	419	340	323	329	139	318	26
Hardware	1,563	1,427	1,483	1,481	1,470	1,641	1,391
Labor	725	768	781	766	798	741	402
Machinists	1,538	976	884	1,091	962	946	910
Masons	757	497	675	679	831	891	465
Music repair	107	107	106	107	98	98	2
Plumbing	3,680	3,425	3,611	3,873	3,918	3,690	2,775
Painters	703	555	651	831	901	981	590
Roofer	443	394	438	403	282	557	241
Rovers	4	198	479	452	646	818	1,213
Shades	310	10	207	-	-	-	-
Sheet metal	593	492	505	508	487	479	438
Steamfitter	2,941	3,602	3,998	3,932	3,887	3,590	2,786
TOTAL work orders	**20,675**	**18,437**	**20,339**	**20,576**	**20,621**	**21,103**	**16,569** *
Total hours	**95,255**	**93,031**	**114,214**	**121,425**	**117,998**	**118,972**	**119,845**

* According to FAM officials, the decline in work orders is due to changes in practices for creating, prioritizing, and closing work orders.

In addition, while the percent of work orders completed on time dipped in 2003 and 2004, it increased to 62% in 2006 and 69% in 2007.

Percent of work orders completed on time

Percent completion rate (no seasonal work orders)

	2001	2002	2003	2004	2005	2006	2007
Completed on time rate	61%	64%	58%	56%	57%	62%	69%

Although there has not been a marked drop in the amount of work performed or in the timeliness of work order completion rates, the level of maintenance workforce frustration I observed could have a direct affect on the ability of management to implement new initiatives or to experiment with strategies that might change the nature and structure of the maintenance program. Foremen expressed significant distrust of management actions and little acceptance of the change in their previous roles, responsibilities, and funding support. The ability of FAM management to develop a new structure for PPS facilities maintenance will depend in large part on regaining the trust and support of the maintenance workforce. Similarly, the maintenance work force must learn to adjust to a changed staffing and budgeting environment.

Best practices for facility maintenance: some practices in place but others absent

Another indication of the capacity of FAM to operate an effective maintenance program is the degree to which it has implemented good management practices that are common to a well functioning maintenance organization. Based on my research of maintenance practices and policies employed in other states, I developed a set of Best Maintenance Practices against which to compare FAM practices. While the existence or absence of these practices at PPS does not automatically indicate a strong or weak program, it provides some indication that the program is operating in a manner that the profession views as necessary for success. See Appendix B for a list of these practices and the source of the practices.

Best practices in place. My review of FAM maintenance practices indicates that many Best Practices are in place and operating as intended. Some of the most significant maintenance practices in place at PPS include:

+ An inventory of buildings and building components FAM is using a software system called *Facilities Center* that employs an inventory module that contains information on each PPS property and building including age, address, square footage, rooms, and major components. Although the information in the system is very useful according to FAM analysts, the current version of the software does not update changes to building components when repairs and upgrades are performed under contract or by others not in the maintenance department.

+ A work order tracking system to record, monitor, and report work accomplished *Facilities Center* also has an automated work order tracking and monitoring system that records work order requests, assigns priorities, tracks work performed and labor hours, and monitors status of completion. In conjunction with the time reporting system, *Facilities Center* provides relatively complete information on work performed by maintenance crews. However, because the current version of *Facilities Center* is old and has not been updated in several years, it also has several weaknesses including the inability to restrict edits and access, and inadequate reporting modules. It also lacks web-based features available in the newer version of the software that would offer improved scheduling and dispatch of work crews, and remote entry of work order activities with hand-held devices. *Facilities Center* also has a preventive maintenance module that was not installed when implemented in early 2000.

+ A program to monitor and control utility costs and manage energy consumption FAM has also implemented a resource conservation and energy cost monitoring program that strives to control resource and energy use at PPS buildings, to monitor and reduce utility charges, and to search for opportunities for improved energy efficiencies. According to officials, this program has helped reduce and avoid over $250,000 in annual costs over the past several years. Additional energy savings would be possible if additional schools could be modernized and retrofitted with more efficient components and devices.

+ Methods for obtaining customer feedback on building maintenance satisfaction Over the past two years, PPS has administered a customer survey to obtain feedback from principals about the quality of FAM facilities

and maintenance services. On average, principals are generally satisfied with both maintenance and custodial services, rating facilities and maintenance services 3.7 on a 5 point scale. Satisfaction levels increased from 3.0 in 2005. (See Appendix C for results of survey.)

+ Basic set of performance measures to report to external users At the request of the Chief Operating Officer, FAM has also developed a set of internal performance indicators that are recorded, monitored, and reported to upper management. The four performance indicators used to track FAM are *percent of work orders completed, spending per square foot, lease revenue performance, and principal satisfaction.* The reporting and use of these indicators is relatively new and PPS and FAM management will be studying the usefulness of these indicators over the next year to determine if new or revised measures are needed.

+ Use of standard purchase agreements for low cost and standardized equipment According to management staff, the maintenance program takes advantage of standardized purchase agreements available from the state and local governments to purchase commonly used items and equipment. However, FAM has not developed standing purchase orders with vendors to get volume discounts for common supplies used by maintenance work crews. Because work crews normally use purchasing cards or local purchase orders to buy goods as needed there may be opportunities for some savings.

Best practices not in place. FAM has also not implemented, or only partially implemented, a number of other best maintenance practices. Some of the most significant practices not currently in place at PPS include:

- No current master maintenance plan and preventive maintenance schedule for major building components The FAM maintenance program lacks a current comprehensive preventive maintenance plan and schedule that identifies the proactive maintenance that will be performed at all PPS schools and buildings and the timelines for completing these tasks. Although the maintenance program developed a comprehensive list of preventive maintenance tasks in 2000, the list has not been updated to reflect current preventive maintenance work priorities and the frequency and timing of preventive maintenance work is not defined. Some preventive maintenance is performed each year by maintenance crews but managers and foremen believe it is inadequate and incomplete to keep pace with deteriorating building infrastructure. According to FAM officials, preventive maintenance

was significantly scaled back due to budget reductions over the past fifteen years.

- No comprehensive manual of maintenance standards and operating procedures The maintenance program does not have a comprehensive manual of policies and procedures to guide the efforts and activities of all the maintenance shops. Some policies and procedures exist in various forms and documents but there is no consolidated written manual that defines how the maintenance program will operate. Maintenance manuals commonly include policies and procedures for work hours, standards of conduct, annual work planning, crew scheduling and supervision, and emergency procedures.

- No current cost of service analysis to compare in-house to contracted service provision FAM has not regularly evaluated in-house maintenance operations costs and contracted service costs to assess potential for cost savings or alternative service delivery. Periodic assessment of in-house and contracted services can help management identify the most effective and efficient method to provide maintenance services. As discussed below, however, an effort to assess and compare costs is currently underway.

- Limited ongoing funding for capital and unexpected major maintenance needs As discussed earlier in this report, PPS has not provided sufficient ongoing capital or major maintenance funding to adequately address deferred and emergency maintenance needs. The significant amount of deferred maintenance needs identified in the recent consultant study provides an opportunity for the district to take a comprehensive assessment of facility conditions and develop a systematic, long-term approach to capital planning and budgeting.

- Minimal training and professional development According to management, maintenance program employees are provided little appropriate training to enhance job satisfaction, efficiency, and safety. FAM lacks a training plan for employees and an annual budget to support training opportunities. While some training is available through various trade unions, the maintenance program does not appear to take advantage of these opportunities. An established training program is viewed as important to help employees remain current with maintenance issues, new technology, equipment, materials, and safety procedures.

- No formal methods for assessing workforce productivity and efficiency To monitor the productivity and efficiency of maintenance workers, the manager of the maintenance program randomly reviews work orders to identify jobs requiring higher than normal hours or supplies. He questions unusually lengthy jobs with foremen and gets explanations for excessive times and costs. He also relies on foremen to monitor the efficiency and productivity of work crews. The maintenance program has not developed formal performance standards for commonly repeated maintenance tasks that would help provide the basis for assigning work, monitoring productivity, evaluating performance, and outsourcing work .

Facility Maintenance Best Practices at PPS: Strengths and Weaknesses

Best Practices in place	Best Practices absent or inadequate
+ Automated building inventory	- No preventive maintenance plan
+ Work order tracking system	- Inadequate capital maintenance funding
+ Utility and energy cost controls	- No maintenance manual of policies & procedures
+ Customer feedback surveys	- Minimal professional development and training
+ Performance measures	- Lack of cost of service information
+ Standard purchase agreements	- Lack of maintenance performance standards

Recent improvement initiatives

FAM has recently taken a number of actions to improve management practices that should help the organization meet a number of other best practice criteria. Some of the major efforts include:

Cost of service information. FAM management has recently initiated an analysis of maintenance cost of services. This analysis will develop a method for analyzing and comparing the full-loaded hourly costs of FAM maintenance to outside contractor bids. The ability to more fully understand the costs of in-house versus outside costs will permit the organization to perform needed maintenance with employees or contractors depending on the most advantageous cost result. Successful implementation of this effort may depend on transparent cost analysis and periodic independent assessment of cost comparison results.

Maintenance priorities. Over the past few months, FAM has begun identifying maintenance priorities for each of the 15 trade shops. Despite the significant reduction in maintenance staffing and funding, FAM did not systematically adjust their work priorities to match the reduced resources available to perform the work. Consequently, management had no assurance that the most important maintenance work was being performed or that the various trade shops were staffed at the most appropriate levels given maintenance priorities. Formalizing work priorities and communicating those priorities to customers will help focus maintenance efforts on the most important tasks and will serve as a basis for determining what important tasks cannot be addressed with current staffing and how to adjust and reassign staff resources.

Organizational structure and supervisory levels. FAM is also in process of developing a new organizational structure to improve reporting relationships and to foster improved coordination between the maintenance and custodial functions. FAM management has also initiated discussions with shop foremen about the most appropriate ratio of foreman to maintenance staff. The current level of 1:3.9 is a remnant of the older, more highly staffed organization and may be lower than necessary when compared to other similar maintenance organizations. However, of the fifteen current foremen, only two are designated as “non-working” foremen, the other thirteen perform maintenance work and may supervise staff as assigned. Further review of the proper role and duties of maintenance foremen might lead to better reporting relationships and a reduced need for supervisory positions.

Generalist labor crews. Over the past several years, FAM has created a generalist class of maintenance worker called “rovers” that perform maintenance and repair tasks that do not require a licensed trade. Tasks such as minor painting and wall repair or furniture and shade repairs that were previously performed by licensed union trades are now performed by employees that are generalists without a trade designation. Rover hourly wage rates are $18 compared to union trade wage rates ranging from $20 to $32 hourly. However, the right balance of generalist and specialist trade staff has not been determined. Additionally, this effort has created some conflict within the organization because of the fear of job losses and the concern that more complex maintenance tasks will be performed at a substandard level.

Labor management committee. FAM management and employees have also embarked on another initiative to improve the operation of the maintenance program and to address long-standing conflicts between labor and management. FAM management has created a labor management committee to improve communication and start discussions on topics that are points of controversy. As of early January, two meetings have been held and attended by representatives from labor and management. A state mediator was hired to help facilitate the discussion. While some are not convinced of its value or confident of success, management and some labor participants believe it is a good step in improving communication and may lead to a better partnership.

FAM management has also reinstated biweekly foremen meetings in October 2007 to address long-standing disagreements between management and labor. Similar to the labor management committee, more frequent meetings between foremen and management are intended to improve communication and to foster better working relationships.

Additional actions to consider

My review of literature on public facility maintenance and on building maintenance approaches employed by other schools districts, revealed a number of practices that might also assist the Facilities and Asset Management Division in restructuring the facilities maintenance operation.

Performance and productivity standards. Facility maintenance managers often have difficulty determining the efficiency and productivity of maintenance workers. Workers are assigned to a variety of work locations and have a great deal of independence to perform work based on their own skills and abilities. Direct supervision is infrequent. Managers often have to rely on work backlogs, industry benchmarks, response times, and general familiarity with the work to assess productivity. While some national labor standards have been developed (e.g. R.S. Means, General Services Administration), these standards may not adequately represent local circumstances.

According to literature I reviewed, one approach to measuring maintenance worker productivity is to develop performance standards for common, repetitive tasks that are unique to the organization. These labor standards could be developed through direct observation of tasks, examining historical data, or from informed and knowledgeable estimates. Other sources could inform development of the standards including information from equipment manufacturers, private sector trades standards, and contractors and consultants.

Performance standards coupled with a manual of operating procedures can help management assess the productivity and efficiency of work crews, adjust staffing levels to meet work demand, and identify critical staffing deficiencies.

Locally developed performance standards could provide FAM maintenance managers with a more objective way to monitor worker productivity. Labor performance standards could also improve work order scheduling, annual work planning, employee morale, and customer service. While it may not be possible to develop performance standards for every work situation, continuing to rely on subjective assessments of worker performance provides management with no assurance that the maintenance program is completing tasks efficiently and effectively.

FAM is currently creating a sound framework for developing performance standards through the recent effort to identify work priorities for each labor shop in the district. Once these priorities are finalized, FAM can begin to track time and effort needed to address these priorities that can be used to establish performance standards for repetitive tasks.

The recently formed labor management committee may be an appropriate forum for initiating the effort to develop performance standards.

Competitive contracting. In the search to provide public services more efficiently and effectively, a number of governments are experimenting with a technique termed "competitive contracting". Competitive contracting is a systematic and formal process for comparing the cost of in-house services to private sector providers. Many governments are finding that public employees can compete successfully with private providers. Some public services subject to competition have become more innovative and productive, and public employee morale improves as employees learn to succeed in a more competitive environment.

A number of specific conditions need to be in place for competitive contracting to be successful. These conditions include:

- **Broad and open competition** Adequate competition between a sufficient number of rivals is needed to produce innovation. Benefits are achieved by competition rather than by whether the service is delivered by public or private employees. Public providers should compete fairly and openly with private firms.

- **Thoughtful selection of services to bid** Real barriers exist to successful competitive contracting including adverse impact on public employees, high risk of failure, political resistance, and unmeasurable performance requirements. If these barriers cannot be removed or mitigated, competitive contracting may not be advisable or feasible.

- **Credible cost comparisons and selection** Private and public competitors must believe that they will be treated fairly. Methods for comparing costs should be clear, reasonable, and unambiguous. An independent third party can add objectivity to the review and selection process.

- **Effective contract management** Contracts should contain clear performance standards, measurable success targets, and incentives to reduce poor performance. It must be monitored carefully and enforced fairly to ensure providers meet expectations.

Competitive contracting may hold some benefits for facilities maintenance at PPS. Maintenance and maintenance related tasks are often the most frequently contracted services in government due to the wide-market of providers, the relative low risk of failure, and the ability to define performance expectations. The recent effort by FAM to establish fully-loaded hourly cost of services for maintenance shops is a critical first step in comparing the cost of in-house maintenance services to outside providers. Without an accurate understanding of the full direct and indirect costs of FAM maintenance services, management lacks assurance that maintenance costs are reasonable and lacks information to improve the efficiency maintenance operations.

Planning and financing facility maintenance. The inability to provide sufficient, ongoing financial support for school facility maintenance is a problem faced by most school districts around the nation. Increasing financial demands and limited resources for the core instructional mission of schools has encouraged districts to defer facility maintenance in favor of instructional priorities. As a result, most districts must rely on periodic local bond measures to repair and replace outdated and deficient school buildings and components. While borrowing funds through the issuance of municipal bonds is a common and acceptable approach for spreading the cost of facilities over the useful life of school buildings, it may not always be the least cost alternative and may encourage premature deterioration of school facilities.

Some states and localities are experimenting with various approaches to funding ongoing maintenance and capital improvement. These approaches often involve more state support for school capital maintenance and the use of alternative funding methods at the local school district level. A number of states have established various policies and programs for loans and grants for school facility improvement and construction. Arizona established three funds to support school facility deficiency correction and building renewal. California established a school facility program to help local districts fund capital maintenance. Maine created a revolving fund for school maintenance and renovation from which local districts can borrow. Other states have established loan programs and grants to support local district capital maintenance efforts.

At the local level, school districts, sometimes with state authorization, have pursued other mechanisms to support ongoing facility maintenance. For example, a number of school districts have established reserve funds and accounts to pay for major maintenance and renovation of older buildings. Reserve accounts are funded by an annual allocation from the general revenues of the district or from other special ongoing revenues. Other local governments, have experimented with public-private partnerships, lease-back arrangements, and space-sharing with other public and private agencies.

PPS has also experimented with various mechanisms to reduce costs, increase revenues, and manage facilities more efficiently and effectively. The closure and sale of surplus schools and the creation of the Portland Schools Real Estate Trust are just two examples. In addition, PPS should consider studying other alternatives to funding a more permanent and ongoing financial support for school facility capital maintenance. Some of the most plausible approaches may include:

- **Construction excise taxes** Recently approved by the School Board, the state authorized construction excise tax may provide the district several million dollars annually depending on the building activity in the area. The law allows proceeds from this tax to be used for capital improvements including construction, renovation, and improvement of school buildings.

- **Building lease revenues** PPS currently generates over $1 million annually in lease revenues from 8 separate building and land leases. Because the maintenance program is funded by general revenues and is not a self-supporting program, lease revenues are not dedicated to maintenance operations but are part of the general operating revenue of the school district and can be used for any purpose. Dedicating property lease revenues to maintenance in addition to their normal budget allocation would provide additional ongoing maintenance support. While dedicating lease revenues to the maintenance program would reduce funding for other PPS activities, it may be appropriate to match the revenue stream from leased assets to the costs of maintaining those assets.

- **Internal cost recovery** FAM should assess the opportunity to recover additional costs for maintenance services provided to other funds or other units within PPS. To the extent possible, internal charges should reflect the full direct and indirect costs of the maintenance service provided. FAM, in consultation with the PPS Finance program, may also wish to explore the feasibility of restructuring the maintenance program as an internal service fund that would support itself fully or partially through charges for service. This effort would require an overall change in PPS budgeting practices that would entail significant planning and effort.

Finally, in view of the recent comprehensive condition assessment of PPS schools and facilities, now may be the best time to develop a comprehensive maintenance and capital plan and a 5 to 10 year capital budget to guide annual maintenance and periodic

facility upgrades and replacements. This maintenance plan and capital budget can be developed in conjunction with the long-term facilities plan that is required with the implementation of the construction excise tax. The development of maintenance and capital plans, and the preparation of a long-term capital budget can be created independently from the identifying sources of funding to address the plans. Although the plans may not receive sufficient resources to address the identified needs, the district and the community should benefit from having a clearer understanding of the cost of facility ownership. Additionally, the district can more fully demonstrate to taxpayers that existing facilities are given appropriate attention and care.

RECOMMENDATIONS

In order to improve the capacity of Portland Public School's facility maintenance program to fulfill its mission, the Facility and Asset Management (FAM) Division should take a number of steps to enhance and support its current improvement initiatives. Some of these actions have a fiscal impact and may require additional investment to implement. Other recommendations should be feasible within FAM's current budget allocation.

Recommendations to enhance current maintenance practices

1. Update or change the current maintenance management software *(Facilities Center)* to add new features that:
    a.) Capture all improvements and changes to the building inventory
    b.) Restrict unauthorized edit and access to system data
    c.) Offer automated scheduling and dispatch of work crews
    d.) Provide for remote or web-based entry of work order activities
    e.) Integrate work order costs more completely and accurately.
2. Review key performance measures to determine if current measures are useful to management and relevant for decision makers. FAM should consider adopting measures that are most relevant to the mission, goals, and objectives of the organization.
3. Explore additional opportunities to develop standing purchase orders with vendors for commonly used supplies and equipment. FAM may wish to request assistance from PPS procurement officials to help identify types of supplies and equipment most frequently purchased that might provide opportunities for savings through standardized, volume purchasing.

4. Continue to develop and analyze the full-loaded hourly costs for each maintenance trade. Conducting a comprehensive assessment of all direct and indirect costs associated with maintenance activities is a critical first step in understanding cost of maintenance services. Understanding the various elements of service costs can help management track the changes in costs over time, set goals for cost reduction and improvement, and compare costs to alternative service providers.

5. Continue to explore opportunities to expand generalist labor pool to perform maintenance tasks that do not require a trade union license. Current efforts to establish maintenance priorities should help management determine which tasks require generalists or specialist expertise so that an appropriate balance can be found in the number of generalist versus specialist licensed trades.

6. Continue efforts to improve labor management relations. Providing an on-going forum to share concerns and to solve mutual problems should help restore trust and contribute to more positive working relationships. FAM should also continue to seek objective and professional outside assistance to guide discussions and facilitate meetings.

Recommendations to implement new maintenance practices

7. Develop a comprehensive manual of operating procedures for the maintenance program. The written maintenance manual should be provided/available to all staff and should include policy and procedures that include: the mission, goals, and objectives of the maintenance program; the organizational structure and reporting relationships; work hours and time reporting; personnel policies and standards for conduct; and methods for acquisition and use of supplies and equipment. FAM should also consider including procedures and guidelines for the work order system; crew scheduling and supervision; performance review and appraisals; training requirements and safety procedures; and general approaches for annual maintenance planning. Reviewing maintenance manuals from other public and private maintenance organizations may provide model to follow and contents to include.

8. Prepare master maintenance plan and preventive maintenance schedule. Management with the assistance of maintenance staff should develop an annual work plan to guide the efforts of the program. To help in preparation of this annual plan, FAM should finalize, implement, and communicate its current effort to prioritize maintenance priorities. In addition, the plan should identify critical preventive maintenance work to be performed by generalist labor and specialists trades during the year and other periodic maintenance activities to perform on a cyclical basis. Sufficient time should be available to perform unplanned emergency and routine maintenance requests. FAM should strive to reduce the percent of emergency work and increase the percent of preventive maintenance.

9. Develop a training and professional development plan for management, administrative, and labor work force. The plan should identify training classes and seminars that are most appropriate to the job classification and most needed to improve the efficiency and effectiveness of the program. FAM should search for opportunities to share, participate in, and utilize low cost or free training available through union halls, regional partners, regulatory authorities, and vendors.

10. Establish performance standards for common and routine maintenance tasks. FAM should first consider developing these performance standards using internal knowledge and expertise and historical data on work orders as a starting point for benchmark standards. FAM should consider supplementing internal assessment with standards from regional public and private organizations, standards developed for the facility maintenance industry, vendor recommendations for maintenance of various building components and equipment.

11. Study current organizational structure and supervisory span of control. FAM should evaluate if the current “trades-based” organizational structure is the most appropriate way to organize and direct maintenance activities or if a “customer-based” or “geographic-based” structure might be more appropriate. Factors that should be considered in evaluating organizational structure include management and supervisory requirements, adequacy of staffing levels, and the ability to share equipment and shop space.

In addition to the above, FAM should consider:

12. Establishing a formal competitive contracting program to help management make decisions on using maintenance employees or private contractors to perform various maintenance services. Program should be based on objective data on in-house and contractor costs, fair comparisons on the full-cost of comparative services, and periodic third-party review of comparison results.

13. Studying opportunities and alternatives for establishing a permanent, ongoing revenue stream to fund capital and major maintenance projects. Options to consider include construction excise tax proceeds, PPS property lease revenues, and internal charges for services. This revenue stream would be in addition to any one-time revenues from property tax levies to address deferred maintenance, renovation, and replacement needs.

MANAGEMENT RESPONSE

PORTLAND PUBLIC SCHOOLS

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Carole Smith
Superintendent

OFFICE OF THE SUPERINTENDENT

February 28, 2008

Mr. Richard Tracey
District Performance Auditor
Portland Public Schools
501 N. Dixon St.
Portland, Oregon 97227

Dear Mr. Tracey,

Thank you for your thorough and helpful audit of Portland Public Schools' Facility Maintenance Services. I believe any management response must begin with the fundamental fact that for years Portland Public Schools has not spent enough to maintain our buildings.

As the property tax limits in Measure 5 phased in, our annual school district budgets became increasingly tighter. This impact was most apparent during the Oregon recession several years ago when we considered such drastic measures as cutting weeks off the school year. During the constant budget cutbacks, direction from our leaders and the School Board was clear: Do all we can to meet student's educational needs and maintain teaching staff.

While we were struggling to maintain our teaching staff, we were not adequately maintaining our buildings. Portland Public Schools had hundreds of employees working in construction trades at the peak of our capital bond project; most were laid off, leaving a skeleton crew to do all of the work. We went from spending far more on facilities maintenance than most school districts to spending below the average. There is no question that the modest millions budgeted for school facilities maintenance was inadequate, but classroom needs came first.

Today while we have a fragile stability in our budget, we have stabilized at an inadequate level. Our maintenance workforce has been cut back drastically and asked to do more with less for years – not a prescription for strong morale. We have, in effect, a triage system for deciding which of the building needs are most urgent.

Your audit could not be timelier.

Over the last few years, we have worked hard to improve our system of assigning work orders, creating flexibility with job assignments and providing needed preventative maintenance and emergency repairs. Bryan Winchester, our Director of Facilities and Asset Management (FAM) since April 2007, continues to improve our systems and processes. Thank you for recognizing the initiatives we are pursuing, and thank you for suggesting new ideas to explore.

Your recommendations to enhance our current maintenance practices are areas that the department has also identified and continues to pursue and develop.

1. **Update or Change the current maintenance software.** *This is FAM's number one priority for software needs. Our current plan projects we will upgrade software when we issue Certificates of Participation in spring/summer 2009.*

2. **Review key performance measures to determine if current measures are useful to management and relevant for decision makers.** *We continue to assess and evaluate the usefulness and relevance of the key performance indicators established in summer 2006. Any specific assistance or alternative performance measurements you could offer would be appreciated.*

3. **Explore additional opportunities to develop standing purchase orders with vendors for commonly used supplies and equipment.** *This is a district-wide initiative being undertaken by the new Budget Director and the Chief Financial Officer.*

4. **Continue to develop and analyze the full-loaded costs for each maintenance trade.** *In November 2007, Facilities and Asset Management completed the new rate structure for Maintenance Services. This structure and pricing reflects more appropriately the actual costs of our business and will be implemented July 1, 2008.*

5. **Continue to explore opportunities to expand generalist labor pool to perform maintenance tasks that do not require a trade union license.** *Over the last 6 years, PPS has expanded the number of maintenance workers "rovers." We continue to discuss with the represented unions and work force, the expansion of this labor pool through shop/trade prioritization, the Labor Management Committee and union negotiations.*

6. **Continue efforts to improve labor management relations.** *During the past eight months the District has settled our trades union contract, instituted bi-weekly Foreman/Management meetings and started a Labor Management Committee. Each of these is a positive step forward in rebuilding trust and the relationship.*

The three further recommendations to implement new maintenance practices (items 7 to 9) are included in the goals and objectives that Facility and Maintenance Services adopted in December 2007. They are:

7. **Develop maintenance and operating procedures.**
8. **Develop and implement a preventive/maintenance schedule.**
9. **Create a training and professional development plan for Facilities and Maintenance Services.**

Each of the remaining items is worth exploring, but Facilities and Asset Management faces some hurdles to full implementation at this time.

10. **Establish performance standards for common and routine maintenance tasks.** *We agree with this goal, and may be able to achieve consistent standards for some tasks, such as replacing water filters. Many of our buildings are so old and so varied that it is impractical to standardize routine maintenance work. Replacing a light switch might include asbestos abatement in one school, while it's a simple task in another. We will work toward this goal in areas where success can be achieved and useful.*

11. **Study current organizational structure and supervisory span of control.** *Some districts organize the work by geographic area, with a maintenance crew responsible for a certain grouping of schools. This has been in the discussion/planning stage and continues to be worth exploring and pursuing, particularly with our generalist labor pool and working foremen. Due to the limited fiscal resources, many of our specialists must cover the entire district (we have one painter, one plasterer, two qualified locksmiths).*

12. **Establish formal competitive contracting program to help management make decisions on using maintenance employees or private contractors.** *We have no interest in contracting out our maintenance services wholesale. However, we will use contractors during peak work periods or for limited projects that exceed our capacity. We also intend to use contractors as a periodic check of our own costs, to ensure that we deliver strong service with our employees at a comparable or better than market price. Additionally, as of October 2007, Maintenance Services no longer performs construction projects and focuses solely on preventative and maintenance tasks. This narrowing and defining of work and customer expectations is an essential step in comparative analysis.*

13. **Study opportunities and alternatives for establishing a permanent ongoing revenue stream.** *In January 2008, the District passed the Construction Excise Tax. This revenue is cyclical and dollar amount is somewhat speculative, but it is an added on-going revenue source. The district already earns lease revenue and income from charges for use of our buildings; we may consider dedicating some of that funding directly to maintenance.*

We hope that this audit is a beginning – not an end. Our desire is to continue the conversations about how to implement best practices most effectively, and we look forward to a follow-up review to assess the good progress we have made.

We greatly appreciate the professional quality of this and past audits, and look forward to further reviews of our school district's performance. It is incumbent on all of us at Portland Public Schools – students and employees alike – to strive for continuous improvement. Your auditing helps us accomplish that end.

Sincerely,

Carole Smith

Carole Smith

C: Cathy Mincberg
Bryan Winchester
Zeke Smith
Jollee Patterson

X:Sup.Sec/2007-2008/chrono/

APPENDICES

APPENDIX A

PPS SCHOOL CAMPUSES AND OTHER FACILITIES

Site name	Address	Zip	Use	Year built
ABERNETHY	2421 SE ORANGE	97214	ELEMENTARY	1924
AINSWORTH	2425 SW VISTA	97201	ELEMENTARY	1914
ALAMEDA	2732 NE FREMONT	97212	ELEMENTARY	1921
APPLEGATE	7650 N COMMERCIAL	97217	HEAD START	1954
ARLETA	5109 SE 66TH AVE	97206	K-7	1929
ASTOR	5601 N YALE	97203	K-7	1949
ATKINSON	5800 SE DIVISION	97206	ELEMENTARY	1953
BEACH	1710 N HUMBOLDT	97217	K-7	1928
BEAUMONT	4043 NE FREMONT	97212	MIDDLE	1926
BENSON	546 NE 12TH AVE	97232	HIGH	1917
BESC	501 N. DIXON ST	97227	ADMINISTRATION	1979
BINNSMEAD	2225 SE 87TH AVE	97216	MIDDLE	1949
BOISE-ELIOT	620 N FREMONT	97227	K-7	1926
BRIDGER	7910 SE MARKET	97215	K-7	1951
BRIDLEMILE	4300 SW 47TH DR.	97221	ELEMENTARY	1956
BUCKMAN	320 SE 16TH AVE	97214	ELEMENTARY	1922
CAPITOL HILL	8401 SW 17TH AVE	97219	ELEMENTARY	1917
CHAPMAN	1445 NW 26TH AVE	97210	ELEMENTARY	1923
CHIEF JOSEPH	2409 N SARATOGA	97217	ELEMENTARY	1949
CLARENDON	9325 N VAN HOUTEN	97203	VACANT	1970
CLARK	1231 SE 92ND AVE	97216	ELEMENTARY	1955
CLEVELAND	3400 SE 26TH AVE	97202	HIGH	1929
COLUMBIA TRANSPORTATION	716 NE MARINE DR	97211	ADMINISTRATION/SPED	1956
CRESTON	4701 SE BUSH	97206	K-7	1946
CSC	531 SE 14TH AVE	97214	VACANT	1911
DAVINCI ARTS MIDDLE SCHOOL	2508 NE EVERETT ST	97232	MIDDLE	1927
DIVISION STREET	7100 SE DIVISION ST	97206	ADMINISTRATION	1961
DUNIWAY	7700 SE REED COLLEGE PL.	97202	ELEMENTARY	1926
EAST SYLVAN	1849 SW 58TH AVE	97221	MIDDLE	1933
EDWARDS	1715 SE 32ND PL.	97214	LEASED TO OTHERS	1960
FAUBION	3039 NE PORTLAND BLVD	97211	K-7	1950
FERNWOOD	1915 NE 33RD AVE	97212	K-8	1911
FOREST PARK	9935 NW DURRETT	97229	ELEMENTARY	1998
FOSTER	5205 SE 86TH AVE	97266	LEASED TO OTHERS	1960
FRANKLIN	5405 SE WOODWARD	97206	HIGH	1915
GEORGE	10000 N BURR	97203	MIDDLE	1950

GLENCOE	825 SE 51ST AVE	97215	ELEMENTARY	1923
GRANT	2245 NE 36TH AVE	97212	HIGH	1923
GRAY	5505 SW 23RD AVE	97201	MIDDLE	1951
GREEN THUMB	6801 SE 60TH AVE	97206	SPECIAL ED	1975
GROUT	3119 SE HOLGATE BLVD	97202	ELEMENTARY	1927
HAYHURST	5037 SW IOWA	97221	ELEMENTARY	1954
HOLLADAY CENTER	2600 SE 71ST AVE	97227	SPECIAL ED	1972
HOLLYROOD	3560 NE HOLLYROOD CT	97212	ELEMENTARY	1959
HOSFORD	2303 SE 28TH PLACE	97214	MIDDLE	1925
HUMBOLDT	4915 N GANTENBEIN	97217	K-7	1959
IRVINGTON	1320 NE BRAZEE	97212	K-7	1932
JACKSON	10625 SW 35TH AVE	97219	MIDDLE	1964
JAMES JOHN	7439 N CHARLESTON	97203	ELEMENTARY	1929
JEFFERSON	5210 N KERBY	97217	HIGH	1909
KELLOGG	3330 SE 69TH AVE	97206	VACANT	1917
KELLY	9030 SE COOPER	97266	ELEMENTARY	1957
KENTON	7528 N FENWICK	97217	LEASED TO OTHERS	1913
KING	4906 NE 6TH AVE	97211	K-8	1925
LANE	7200 SE 60TH AVE	97206	MIDDLE	1926
LAURELHURST	840 NE 41ST AVE	97232	ELEMENTARY	1923
LEE	2222 NE 92ND AVE	97220	K-7	1952
LENT	5105 SE 97TH AVE	97266	K-7	1948
LEWIS	4401 SE EVERGREEN	97206	ELEMENTARY	1952
LINCOLN	1600 SW SALMON	97205	HIGH	1950
LLEWELLYN	6301 SE 14TH AVE	97202	ELEMENTARY	1928
MADISON	2735 NE 82ND AVE	97220	HIGH	1955
MALLORY	4231 NE MALLORY	97211	VACANT	
MAPLEWOOD	7452 SW 52ND AVE	97219	ELEMENTARY	1948
MARKHAM	10531 SW CAPITOL HWY	97219	ELEMENTARY	1950
MARSHALL	3905 SE 91ST AVE	97266	HIGH	1959
MARYSVILLE	7733 SE RAYMOND	97206	K-7	1921
MEEK PROFESSIONAL TECHNICAL	4039 NE ALBERTA CT.	97211	ALTERNATIVE	1953
MLC	2033 NW GLISAN	97209	ALTERNATIVE	1914
MT. TABOR	5800 SE ASH	97215	MIDDLE	1952
OCKLEY GREEN	6031 N MONTANA	97217	K-8	1925
PENINSULA	8125 N EMERALD	97217	K-7	1952
PORTSMOUTH	5103 N WILLIS BLVD.	97203	K-8	1927
RICE	6433 NE TILLAMOOK ST	97213	ADMINISTRATION	1955
RICHMOND	2276 SE 41ST AVE	97214	ELEMENTARY	1908
RIEKE	1405 SW VERMONT	97219	ELEMENTARY	1959
RIGLER	5401 NE PRESCOTT	97218	K-7	1931
ROOSEVELT	6941 N CENTRAL	97203	HIGH	1921
ROSA PARKS	8960 N WOOLSEY AVE	97203	ELEMENTARY	2006

ROSE CITY PARK	2334 NE 57TH AVE	97213	VACANT	1911
ROSEWAY HEIGHTS	7334 NE SISKIYOU	97213	K-8	1923
SABIN	4013 NE 18TH AVE	98212	K-7	1927
SACAJAWEA	4800 NE 74TH AVE	97218	HEAD START	1952
SCOTT	6700 NE PRESCOTT	97218	K-7	1949
SELLWOOD	8300 SE 15TH AVE	97202	MIDDLE	1913
SITTON	9930 N SMITH	97203	ELEMENTARY	1949
SKYLINE	11536 NW SKYLINE BLVD	97231	K-7	1939
SMITH	8935 SW 52ND AVE	97219	VACANT	1958
STEPHENSON	2627 SW STEPHENSON	97219	ELEMENTARY	1964
SUNNYSIDE	3421 SE SALMON	97214	K-8	1925
TERWILLIGER	6318 SW CORBETT ST	97201	LEASED TO OTHERS	1917
TUBMAN	2231 N FLINT	97227	MIDDLE	1952
VERNON	2044 NE KILLINGSWORTH	97211	K-8	1931
VESTAL	161 NE 82ND AVE	97220	K-7	1929
WEST SYLVAN	8111 SW WEST SLOPE DR	97225	MIDDLE	1953
WHITAKER LAKESIDE	5135 NE COLUMBIA BLVD	97211	LEASED TO OTHERS	1964
WHITMAN	7326 SE FLAVEL	97206	ELEMENTARY	1954
WILCOX	833 NE 74TH AVE	97213	ADMINISTRATION	1959
WILSON	1151 SW VERMONT	97219	HIGH	1954
WINTERHAVEN	3830 SE 14TH AVE	97202	K-8	1930
WOODLAWN	7200 NE 11TH AVE	97211	K-7	1926
WOODMERE	7900 SE DUKE	97206	ELEMENTARY	1954
WOODSTOCK	5601 SE 50TH AVE	97206	ELEMENTARY	1924
YOUNGSON	2704 SE 71ST AVE	97206	SPECIAL ED	1955

APPENDIX B

Facilities Maintenance – Best Practices

Sources: Florida State Department of Education; Minnesota Auditor General; Idaho Department of Education; Association of School Business Officers; Collaborative for High Performance Schools

Program Direction and Accountability

a. Written mission statement, goals, objectives – clearly defines purpose and expected outcomes of the department.

b. Procedures to measure, report, and improve performance. Performance indicators are developed, reported, and used to manage and improve efficiency and effectiveness.

c. Customer feedback used to identify problems and improve performance. Surveys are shared with management and staff.

d. Written operating procedures to guide efforts – Procedures include maintenance and repair standards, hiring and staffing policies, personnel policies, vehicle use, acquisition and use of equipment/supplies policies, work order policies, performance and ethical expectations, etc.

e. Annual maintenance plan – work that will be performed during the year. Preventive, routine, capital, emergencies. Locations.

Organizational Structure and Staffing

f. Regular review organizational structure, administrative layers, and supervision and staffing levels. Organization chart is current and accurate. Supervisor and employee ratios are appropriate. Staffing levels compare to benchmarks.

g. Complete job descriptions are in place. Positions and job descriptions match need. Roles and relationships between schools, custodians, maintenance, and management are clearly explained.

h. Appropriate training and staff development program in place. Training programs keep staff current and competent on technical and safety requirements.

Resource Allocation and Utilization

i. Annual budget is prepared that addresses both short and long- term maintenance goals. Budget addresses ongoing and recurring tasks, and allocates resources for deferred maintenance needs. Systems properly account for spending.

j. Ongoing funding for capital and unexpected maintenance needs. Use maintenance reserve fund and/or capital improvement budget.

k. Good purchasing practices used. Maintenance components are standardized and volume purchasing is used.

l. Staff have access to required tools and equipment. Seldom used tools and equipment are available if needed. Staff can acquire parts and materials when needed. Procedures in place to dispose of surplus equipment and materials.

m. Proactive maintenance practices are employed. Standardized preventive maintenance program is in place. Unique preventive maintenance plan for each building. PM plans identify major components needing preventive maintenance, tasks to be performed, frequency and schedule of pm, and pm procedures for each task.

n. Cost of maintenance services understood and compared when appropriate to outside costs. Average full-loaded direct cost of maintenance hour is understood. Ability to compare the costs of in-house to contracted out maintenance projects.

Information Management

o. Complete inventory of buildings and building components. Ongoing assessment of building conditions and deficiencies. Building inventories updated when components are replaced, renovated, or added.

p. Automated work order tracking and processing system in place. System includes features for identifying requestor, assignment, priority, cost, and location. Work order system used to analyze performance and plan maintenance.

q. System for prioritizing maintenance needs by importance, severity, equity, and cost. Methods for coordinating and synchronizing maintenance work.

Health and Safety

r. Policies and procedures clearly address health and safety features of facilities. Identification of critical health and safety features that must be addressed by maintenance each year or on established milestones.

s. Federal and state health and safety mandates are complied with. Primary code compliance requirements that must be met.

APPENDIX C

2007 Department Satisfaction - Facilities & Maintenance

Please rate how IMPORTANT you believe the following Department services are to the success of your school, program or department.

	Total N	Total Mean	School N	School Mean	BESC N	BESC Mean
Custodial services	107	4.8	85	4.9	22	4.5
Emergency work orders	103	4.8	84	4.9	19	4.4
Rover work orders	99	4.5	84	4.6	15	4.0
Renovations/new builds	88	4.3	71	4.4	17	3.9
Environmental health & safety oversight	103	4.6	83	4.7	20	4.3
2007 mean score		4.6		4.7		4.2
2005 mean score		4.6		4.6		

Please rate how SATISFIED you are with the following Department services.

	Total N	Total Mean	School N	School Mean	BESC N	BESC Mean
Custodial services	106	3.5	85	3.5	21	3.4
Emergency work orders	100	3.8	84	3.7	16	4.0
Rover work orders	90	3.5	81	3.6	9	3.4
Renovations/new builds	71	3.1	57	3.0	14	3.7
Environmental health & safety oversight	98	3.7	80	3.7	18	3.9
2007 mean score		3.6		3.5		3.7
2005 mean score		3.0		3.0		