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Functional Performance Audit of the Educational Facilities Department *for Alexandria City Public Schools*

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Introduction

School facilities should be designed and maintained to provide an effective learning environment that is educationally adequate to deliver the curriculum. Having suitable school facilities requires good planning and communication between facilities planning, design, construction, and operations and maintenance staffs.

Once schools are built, an effective facility maintenance program (i.e., an ongoing plan for addressing preventive and corrective maintenance) and a long-term capital improvement program should be instituted. One of the most important aspects of maintaining facilities in the long-term is preventive maintenance. Through preventive and predictive maintenance, life cycle costs can be reduced and facilities reach their full serviceable life. In addition, adequate custodial and grounds operations are necessary to provide clean, safe, and healthy learning environments.

This report presents the results of an audit of the Alexandria City Public Schools (ACPS) Educational Facilities Department. This audit was conducted by Gibson Consulting Group, Inc. (Gibson) from April 2017 through August 2017.

Project Objectives, Scope and Approach

The primary objective of this facilities audit was to evaluate ACPS' asset management, budget management, and contract management functions within the School Division's Educational Facilities Department. The scope of the audit included a review and evaluation of:

- Administrative regulations, policies, procedures, and industry standards regarding facilities maintenance;
- The efficiency and effectiveness of Educational Facilities operations by benchmarking key operational statistics and comparing them to school division best practices;
- The processes for creating the Long-range Facilities Plan, Capital Improvement Plan, and facilities budgets for operating and capital improvement funds;
- Departmental processes for managing and monitoring construction and renovation projects, including cost estimation and actual costs tracking; and,
- Organizational structure, job descriptions, and related training requirements.

The audit approach involved the collection and analysis of data; interviews with school division leadership, Educational Facilities staff, school principals, and custodial and maintenance workers; and, school site visits. See Appendix A for a complete list of interviewees and schools visited.

ACPS School Board Policy Framework

ACPS School Board policies provide guidance for the full cycle of activities related to planning, design, construction, operations, maintenance and retirement of ACPS school facilities. There are eight board policies relevant to the scope of this audit:

- **EA - Support Services** – Requires that the School Board ensure the proper operation, maintenance, and management of school buildings, grounds, vehicles, equipment, and services.
- **EBA - Buildings and Grounds Inspection** – Requires schools to be inspected at reasonably frequent intervals. Inspections required by law will be performed as required by law.
- **EC - Buildings and Grounds Management and Maintenance** – Specifies that the Superintendent will have the general responsibility for the care, custody, and safekeeping of all school property, and will maintain a program of preventive maintenance, and that the principal of each school in coordination with the Department of Educational Facilities will be responsible for the operation, supervision, care, and maintenance of the school plant.
- **FA - Facilities Development** – Outlines the Board’s goals with respect to facilities development and ACPS’ Capital Improvement Program (CIP).
- **FA-R - ACPS Energy Conservation and Building Management Regulations** – Specifies the energy management responsibilities for some positions, and details regulations related to classrooms, air conditioning equipment, heating equipment, lighting, and water.
- **FEA - Educational Facilities Specifications** – Requires that detailed educational specifications be prepared for the design and construction of new buildings.
- **FEG - Supervision of Construction** – Requires supervision and sound financial management of all construction funds.
- **FEG-R - Capital Improvement Program Regulations** – Outlines the procedures for the development, approval, management and payment of projects in the ACPS CIP.

Key Terms

Throughout this report, terms and acronyms are used that are common to those involved in the facilities management industry but may not be familiar to others. Below is a listing of key terms and their definitions:

- **Maintenance** is the act of keeping fixed assets in acceptable and functional condition. It includes preventive maintenance, normal repairs, replacement of parts and structural components, and other activities needed to preserve the facility asset so that it continues to provide acceptable services and achieve its expected life. Maintenance excludes activities aimed at expanding the

capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than, those originally intended.

- **Corrective Maintenance (CM)** are those maintenance activities performed because of equipment or system failure. Activities are directed toward the restoration of an item to a specified level of performance, and sometimes called "breakdown maintenance."
- **Current Replacement Value (CRV)** is the amount required to reproduce a facility in like kind and materials at one time, in accordance with current market prices for materials and labor.
- **Deferred Maintenance (DM)** refers to any maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period.
- **Preventive Maintenance (PM)** involves planned actions undertaken to retain an item at a specified level of performance by providing repetitive scheduled tasks which prolong system operation and useful life (i.e., inspection, cleaning, lubrication and part replacement).
- **Proactive Maintenance (PrM)** includes activities applied to equipment prior to and during operation to prevent problems, gain greatest reliability, and minimize failure.
- **Computerized Maintenance Management System (CMMS)** provides information about an organization's maintenance operations. Typical components of a CMMS include service call tracking, maintenance work order management, preventive maintenance scheduling, and asset inventory.
- **Facility Condition Index (FCI)** is a standard facility management benchmark that is used to objectively assess the current and projected condition of a building asset. The purpose of the FCI is to provide a means for a relative comparison of facility or building conditions as well as allowing senior decision-makers to understand building renewal funding needs and comparisons. The FCI is defined as the ratio of current year required renewal cost to current building replacement value. Building condition is often defined in terms of the FCI as follows: (Good) 0 to 5 percent FCI, (Fair) 5 to 10 percent FCI, (Poor) 10 to 30 percent FCI, (Critical) greater than 30 percent FCI.
- **Facility Condition Assessment (FCA)** is a systematic approach of identifying, assessing, prioritizing, and maintaining the specific maintenance and repair requirements for all facility assets to provide valid documentation, reporting mechanisms, and budgetary information in a detailed database of facility concerns.
- **Facility Management (FM)** is the profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology.
- **Key Performance Indicator (KPI)** is derived from specific measurement of data relating to performance. Indicators can reflect efficiency, effectiveness, and financial return. KPIs are distinguished from common management metrics in that, while they are a type of metric, they

are the most important of an organization's metrics which link specifically to the organization's strategic initiatives.

Audit Summary

This audit found that enrollment at most schools is at or exceeding capacity, and that ACPS has made progress in addressing those needs by developing a Long Range Educational Facilities Plan which is guiding annual Capital Improvement Plan requests. Funding remains a challenge, as not all capital improvement needs can be met and operations and maintenance expenditures are below national and Virginia averages. ACPS lacks a facilities management plan for addressing non-capacity capital renewal, major repairs, deferred maintenance reduction, and preventive maintenance actions that will preserve the value of ACPS facility assets.

Based on school visits and interviews with school administrators, the Educational Facilities Department generally received negative feedback for their responsiveness, communication, and overall condition of facilities. While this sentiment was not universal, there was a consistent perception that maintenance is reactive, not proactive, and that problems receive attention only when they rise to the level of crisis.

A factor contributing to the negative feedback is that ACPS does not maximize the use of its computerized maintenance management system (*SchoolDude*) to track all maintenance and repair work. The Preventive Maintenance module has not been incorporated into the system, and the system's poor configuration results in insufficient management information to support effective decision-making. Also, Educational Facilities has not dedicated the resources needed to use the system to its full potential for measuring, managing, and reporting on all facilities management actions.

ACPS has adopted a staffing model of employing a small in-house workforce for responding to minor, day-to-day maintenance needs and using outsourced contractors to perform the majority of the preventive and corrective maintenance actions that keep facilities functioning properly. However, there is no formal quality assurance program for oversight of much of the outsourced work.

ACPS performs some activities that relate to energy management, but there is no strategy to organize energy efficiency efforts. The Department does not have a formal energy management program to programmatically plan, implement, and measure results of consumption reductions or energy cost savings nor has anyone been designated to manage such a program.

Custodial services are provided by both ACPS division employees as well as two contracted service providers. This hybrid staffing model has resulted in wide variations across schools in terms of staffing levels, workloads, and custodial expenditures. The grounds maintenance function, on the other hand, is accomplished by a combination of outsourced and shared services with the City of Alexandria and is performing satisfactorily.

To address these findings and to improve the overall efficiency and effectiveness of ACPS facilities management functions, the audit team developed the following 10 recommendations, which are

presented in Table 1 in the order that they appear in the report. The audit team also assigned a priority level to each recommendation.

Table 1. Summary of Audit Recommendations

No.	Priority	Recommendation
1	High	Develop a comprehensive, long-term school facilities management plan.
2	Low	Refine and expand key performance indicators (KPIs) and metrics for facilities management.
3	High	Institute a formal quality assurance oversight system for review of contracted facility maintenance and repair services.
4	Medium	Enhance the use of the <i>SchoolDude</i> to improve maintenance management and efficiency.
5	Medium	Establish a Work Controller position (in-house or contracted) dedicated to work management oversight and reporting.
6	High	Implement a system to proactively communicate with school principals about facility maintenance activities and issues.
7	Medium	Designate an Energy Manager and establish an Energy Management Program.
8	Low	Continue with the Department’s long-term plan to reduce in-house custodial operations through attrition, and re-evaluate the cost structures of contracted service providers.
9	Medium	Have ACPS custodians and Building Engineers report centrally to the Building Services Manager rather than to school principals.
10	Medium	Reduce custodial FTE at non-contract schools to bring workloads more in line with industry standards for staffing efficiency at all schools.

The remainder of this report details the audit findings and recommendations for each of the functional areas within the Educational Facilities Department and is organized into the following major sections:

1. Facilities Planning and Management
2. Facilities Maintenance
3. Custodial Services
4. Grounds Management

Section 1 – Facilities Planning and Management

The ACPS Department of Educational Facilities oversees building infrastructure, custodial services, emergency management, maintenance, safety and security, and the planning, design and construction of school buildings.¹ Specifically, the Department is responsible for operating and maintaining 16 traditional schools and other facilities comprising about 2.2 million square feet of building space. ACPS facilities include 12 elementary schools, one Pre-K-8 school, 2 middle schools, one high school (comprised of two campuses), and four additional facilities. Table 2 presents a summary ACPS facilities.

Table 2. Summary of ACPS Facilities

School Level	Number	Area in GSF	Lot Size (Acres)	Average Age of Buildings (Years)	Current Replacement Value (CRV) ²
Elementary	12	973,817	95	64	\$263,904,407
Pre-K-8	1	124,000	10	3	\$33,604,000
Middle	2	473,457	48	72	\$128,306,847
High	1	591,582	32	37	\$160,318,722
Other Facilities	4	56,479	N/A	N/A	\$15,305,809
Total	20	2,219,335	185	58	\$601,439,785

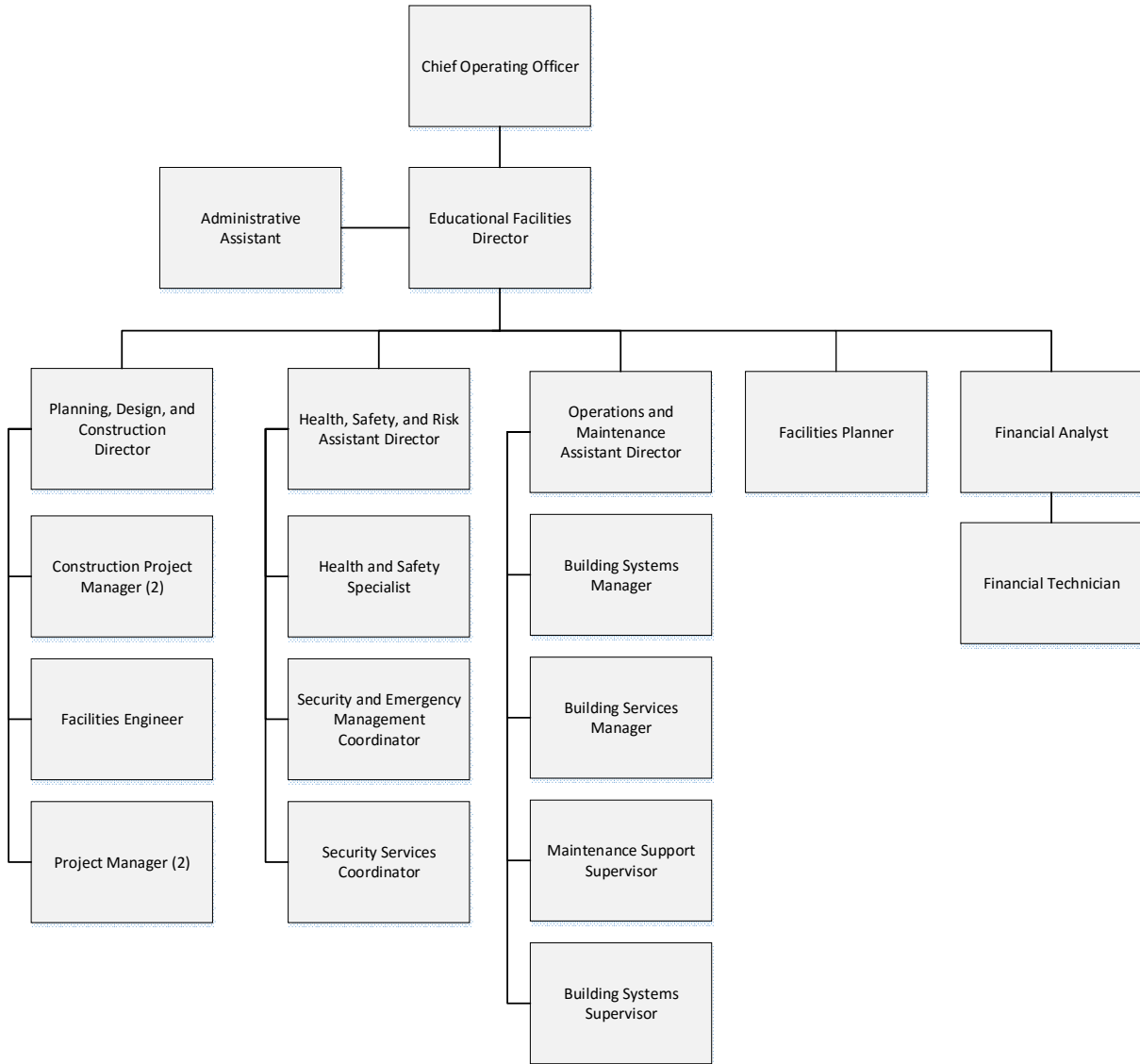
Source: ACPS (Files - EG Building Inventory; Energy Usage 2013-2016; Long Range Educational Facilities Plan).

The Educational Facilities Department is comprised of 32 full-time equivalent (FTE) positions organized under the Chief Operating Officer and led by the Director of Educational Facilities. Custodial and maintenance operations are provided through a combination of in-house and contracted service providers. Grounds upkeep is fully outsourced and is accomplished through a combination of a services provided by a landscaping contractor and the City of Alexandria. Figure 1 provides an overview of the Department's current organizational structure.

¹ The school security function was not within the scope of this audit.

² CRV is calculated at \$271/gsf replacement cost estimate, the average for VA schools (State of Our Schools: America's K–12 Facilities 2016).

Figure 1. Department of Educational Facilities Organizational Chart



Source: ACPS

School Capacity and Capital Projects

School capacity issues stemming from steadily growing enrollment were cited by many ACPS officials as the top challenge facing ACPS educational facilities. Table 3 shows that total ACPS school square footage per enrolled student has decreased in each of the past four years and is less than the Commonwealth of Virginia school average in both 2016 and 2017.

Table 3. ACPS and VA Average Gross Square Feet per Student, 2014-17

	2014	2015	2016	2017
Gross Square Footage (Schools Only) ¹	2,149,739	2,149,739	2,162,856	2,162,856
Total Enrollment ²	13,563	14,167	14,670	15,056
ACPS GSF/Student	159	152	147	144
VA Average Area Per Student, 2013³	151			

Sources: ¹ACPS (Files - EG Building Inventory; Energy Usage 2013-2016)

²ACPS iDashboard (<http://idashboard.acps.k12.va.us>)

³State of Our Schools: America's K–12 Facilities 2016

The magnitude of this issue is further demonstrated by examining the enrollment capacity for each school. Table 4 shows the current enrollment, student capacity, and percent capacity for each school.³ All but one ACPS school was at greater than 90 percent capacity and most schools exceeded 100 percent capacity in 2017.

Table 4. ACPS School Capacity, 2017

School	FY 2017 Total School Enrollment*	Current Capacity	Capacity
Charles Barrett	485	524	92.6%
Cora Kelly	468	429	109.1%
Douglas MacArthur	704	554	127.1%
George Mason	555	368	150.8%
James K. Polk	773	756	102.3%
Jefferson-Houston	490	535	91.6%
John Adams	1,092	858	127.3%
Lyles-Crouch	436	375	116.3%
Matthew Maury	417	350	119.1%
Mount Vernon	881	755	116.7%
Patrick Henry	713	724	98.5%
Samuel Tucker	790	620	127.4%
William Ramsay	908	748	121.4%
Elementary Total	8,712	7,596	114.7%
Francis C. Hammond	1,409	1,396	100.9%
George Washington	1,333	1,150	115.9%
Jefferson-Houston	144	245	58.8%

³ The Long Range Educational Facilities Plan for ACPS defines capacity as “a product of the number of classrooms at a school and the number of student stations assigned to each room type. Only classrooms that are 600 square feet or more with a teacher and students regularly assigned to the space are counted toward full time capacity. For elementary schools, small instructional spaces and specialized labs including art, music, or resource are not part of the capacity calculation. It is possible for a school’s capacity to change from year to year based on average class sizes (determined by the budget) or changes in the number and type of programs.”

School	FY 2017 Total School Enrollment*	Current Capacity	Capacity
Middle School Total	2,886	2,791	103.40%
T.C. Williams King Street	2,943	2,766	106.4%
T.C. Williams Minnie Howard	811	883	91.9%
High School Total	3,754	3,649	102.9%

*Includes all ACPS students as well as the amount of spaces partners have within ACPS facilities.

Source: ACPS (Item 31 Info).

Commendation 1: The Department has a comprehensive long-range facility plan that addresses ACPS' capacity needs.

ACPS is addressing its capacity issues through long-range facility planning and capital improvement projects. In June 2015, ACPS adopted a Long Range Educational Facilities Plan (LREFP) that identifies the types of facilities that can best meet the ACPS' educational needs over the next 25 years. The LREFP extensively analyzed and documented city demographics, enrollment projections, educational specifications (ED Specs) for the size and type of elementary and middle schools needed in the future, existing school capacities and configurations, and City of Alexandria planning considerations to develop "Mini Master Plans" for each school. Future efforts are expected to more thoroughly address Ed Specs and school needs for pre-K and high school facilities.

The LREFP was jointly prepared by ACPS in conjunction with the City of Alexandria, adopted by the ACPS School Board, and endorsed by the Alexandria City Council. This high degree of collaboration and alignment should facilitate execution of the LREFP and begin to address the over-capacity challenges at ACPS. It will also help ACPS and the City to prioritize spending as reflected in the Capital Improvement Plan (CIP) budget and guide the development of future schools in a fiscally-constrained environment.⁴ It is unlikely that the City of Alexandria will be able to fully fund all ACPS' capacity needs, so the LREFP will remain an essential tool for school development decision-making. Based on Virginia averages of \$271/GSF for new school construction and 151 GSF per new seat added⁵, ACPS would need approximately \$163 million to accommodate its projected enrollment growth of approximately 4,000 students from 2017 to 2026. ACPS has identified in its 2017 CIP budget approximately \$233 million⁶ for school modernization and capacity-related capital projects from 2017 to 2026, a figure that is 43 percent higher than the Virginia average.⁷ This difference can be explained by the fact that ACPS' new construction needs are based on specifically-identified projects, local construction cost factors, and prior construction experience, not just state averages.

⁴ The CIP is a ten-year plan that is updated annually and considers revised enrollment projections and other factors to be addressed by capital funding in the current (budget) year.

⁵ State of Our Schools: America's K-12 Facilities 2016

⁶ The 2017-2026 CIP Budget identifies approximately \$239 million in capacity and modernization projects; the project for an expansion to the transportation facility (estimated at \$6.1 million) was excluded from this figure.

⁷ The City of Alexandria defines a capital project as "one that acquires or improves a physical asset with a useful life of three or more years for greater than \$10,000; not day-to-day maintenance."

To execute the projects approved in the CIP, multiple contracting vehicles are available to select an architect/designer based on the size and type of project anticipated. The approach to acquisition of construction services is selected based on the best fit for project requirements (Design-Bid-Build, Design-Build, Construction Management at Risk, or Job Order Contract), and is not constrained to a “cookie-cutter” solution for all projects. ACPS engages external consultants for large and/or complex projects. For example, ACPS contracted with a cost estimating firm to assist with project budgeting, and a project management firm to coordinate and drive all aspects of design and construction of the Patrick Henry Elementary School.

The Department’s project managers and external consultants and contractors use tools and methods that are common to the design and construction industry for project management tracking and reporting during the execution phase of projects. ACPS also conducts formal, one-year post-occupancy evaluations on major capacity projects (i.e., new footprint or modernization projects) to capture lessons learned and update design and construction standards for future projects. Collectively, these techniques are consistent with a well-managed construction practice.

During the development of major projects, which normally have high visibility because of the underlying educational needs, community impacts, and budget implications, ACPS places special emphasis on communication and stakeholder engagement. As was noted earlier, fiscal constraints force the prioritization of needs when selecting which projects to pursue as well as when determining the scope of individual projects during the planning and design phases. The decision to reduce a project’s scope to meet budget can result in facilities that are acceptable, but less than optimum, in their size, configuration or long-term maintainability. ACPS has undertaken several actions to engage stakeholders when these decisions must be made. Internally, Department staff hold weekly project review meetings with design, construction, and maintenance team members for coordinating project execution details and additional meetings with contracting staff members to ensure procurement tasks remain on track. ACPS also conducts weekly Capital Coordination Committee (CCC) meetings with the Superintendent to provide a briefing on project status, any on-going challenges and potential issues that may be developing. Bi-weekly meetings with City zoning, planning, and real estate officials serve to coordinate the planning efforts that are needed prior to City approval of major construction projects. A monthly meeting of the City Schools Sub-Committee includes the Alexandria City Mayor and Vice Mayor, the ACPS Superintendent and Assistant Superintendent, and respective staff members as appropriate for the topics being discussed. ACPS Educational Facilities staff also provide a quarterly brief to the School Board on the status of CIP projects and any significant updates since the last report. “No surprises” was a repeated theme when it came to communicating about capital projects.

Facility Asset Management

In addition to addressing ACPS’ capacity needs, the 2017 CIP budget earmarks \$58 million for “non-capacity” capital projects over the ten-year CIP period. These non-capacity capital projects address needs such as school security systems, playground or athletic area improvements, and the deteriorating condition of aging infrastructure. This non-capacity funding is essential for a school division such as ACPS,

where the average building age for schools is 58 years (compared to the average age of public schools across the U.S. of 44 years⁸). As stated in the LREFP, “most of the City’s public schools were constructed prior to 1960 and currently require a relatively high level of maintenance and repair expenses just to keep basic systems operating and structures safe and sound.”

Finding 1: ACPS spends less on routine maintenance and operations than what is recommended by industry standards to operate healthy, safe, and educationally appropriate facilities.

In its report, *State of Our Schools: America’s K–12 Facilities 2016*, the National Council on School Facilities recommended that Virginia schools plan to spend an amount equal to at least 4 percent of its facilities’ current replacement value annually in capital funds on building system and component renewals, reducing accumulated deferred maintenance, and making alterations to ensure that its existing facilities support the educational programs and modern health and safety requirements. For 2017, approximately \$6.5 million was identified for CIP projects to correct major deficiencies such as roof repairs and HVAC equipment replacement in ACPS school facilities. This amount represents a reinvestment of only 1.1 percent of the current replacement value of the school facilities, which is well below the industry standard.

Exacerbating this shortfall in spending on capital renewal efforts for correcting system deficiencies, is ACPS’ modest spending on routine maintenance and operations. The August 2016 results of the ACPS 2020 Community Survey showed that only 54 percent of respondents agreed that ACPS provides optimal learning environments within each school, which is reflective of the lack of investment in the maintenance of facilities. The National Council on School Facilities suggests that for Virginia school divisions to operate healthy, safe, and educationally appropriate school facilities, they should plan to spend from annual operating budgets an amount equal to at least 3 percent of the facilities’ current replacement value on maintenance and operations. Table 5 shows that ACPS has consistently fallen below this and other benchmarks that are indicators of the level of funding expected to properly sustain its facilities.

Table 5. Operations and Maintenance Spending Benchmarks

Measure	2014	2015	2016
O&M Expenditure Amount ^{1,2}	\$11,512,432	\$11,460,440	\$12,581,469
CRV (All facilities, not just schools) ³	\$597,787,518	\$597,787,518	\$601,439,785
O&M Expenditure as a % of CRV	1.9%	1.9%	2.1%
National Council on School Facilities Benchmark⁴	3.0%		
Gross Square Footage (All facilities) ⁵	2,205,858	2,205,858	2,219,335
O&M Expenditure per GSF	\$5.22	\$5.20	\$5.67
VA Avg. O&M of Plant per GSF⁴	\$6.95		
Nat’l Avg. O&M of Plant per GSF⁴	\$6.64		

⁸ IES. 2014. Condition of America’s Public School Facilities: 2012 –13. Institute of Educational Sciences, U.S. Department of Education.

Measure	2014	2015	2016
IFMA (Education sector) ^{5 6}	\$6.57		
Total Enrollment ⁷	13,563	14,167	14,670
O&M Expenditure per Student	\$849	\$809	\$858
VA Avg. O&M of Plant per Student ⁴	\$1,052		
Nat'l Avg. O&M of Plant per Student ⁴	\$1,039		

Notes: ¹ACPS (Request No 11_FY14 FY15 and FY16 Operating Budget and Expenditures)

²Includes cleaning, routine and preventive maintenance, minor repairs, utilities, and school security. Utilities and security included to provide an equal basis for comparison, as VA schools' benchmark data do not segregate these costs from the other O&M costs.

³Calculated at \$271/gsf replacement cost estimate, the average for VA schools (State of Our Schools: America's K-12 Facilities 2016)

⁴State of Our Schools: America's K-12 Facilities 2016

⁵ACPS (Energy Usage 2013-2016)

⁶International Facility Management Association, Research Report #32, Operations and Maintenance Benchmarks (2009)

⁷ACPS iDashboard (<http://idashboard.acps.k12.va.us>)

CRV: Current Replacement Value

Finding 2: The Department's current system for monitoring and adjusting asset condition data is fragmented.

ACPS engaged the services of an engineering firm in 2015 to perform a facility condition assessment (FCA) of its schools. An FCA provides the data necessary to understand existing facilities condition, identify strategies to meet facility life-cycle needs, and create the foundation for an overall capital renewal plan. However, there are no consistent methods currently in place to perform analyses of the facility condition indexes (FCIs) calculated during this study, update deferred maintenance needs as projects are completed, or develop complete and consistent expected renewal expenditures that are matched to the FCAs. This shortcoming also impacts the ability to implement a rational approach to fair and equitable allocation of funding to various schools. There should be a documented approach to manage the FCA results and translate them into a facility management program that can be used to develop and justify budgets for life-cycle renewal and on-going maintenance needs.

Recommendation 1: Develop a comprehensive, long-term school facilities management plan.

Based on a review of current funding levels, historical capital and operating expenditures, and school conditions, a comprehensive long-term facilities management plan is recommended. The integrated plan should recognize the school utilization and improvement plans described by the LREFP and focus on additional non-capacity capital renewal, major repairs, deferred maintenance reduction, and preventive maintenance actions that will preserve the value of ACPS facility assets. Planning for the maintenance of school facilities in a manner that is compatible with LREFP supports ACPS's goal of providing optimal and equitable learning environments.

ACPS has already completed a key step in defining its long-term maintenance and renewal needs by conducting a Facility Condition Assessment through an external consultant in the 2014-15. The FCA reports describe, by school, the existing facilities conditions, strategies to meet facilities life cycle needs, and a 10-year projection for an overall capital renewal plan by year. Building systems and related components are rated as Good, Fair, or Poor, and deficiencies are recommended for correction as “Immediate Repairs” (current year) or “Capital Reserve” (future years).

The long-term facilities management plan should also document a strategy for a preventive maintenance program. As was noted earlier, most preventive maintenance at ACPS is performed by outsourced contractors. There are no documented preventive maintenance work orders or job plans in the ACPS computerized maintenance management system, *SchoolDude*. ACPS has not set goals for the proportion of its budget that should be dedicated to preventive maintenance nor is it collectively tracking the preventative maintenance work performed by its contractors.

While there is no universally accepted standard for the degree of preventive maintenance needed to care for K-12 facilities, a well-accepted standard is from the Association of Physical Plant Administrators (APPA) Leadership in Educational Facilities, an organization whose focus is facilities in an educational environment. APPA’s Levels of Service help describe the characteristics of a facilities maintenance program on a five-point scale. APPA’s definitions for the degree of preventive maintenance versus corrective maintenance at each level are shown in Table 6.

Table 6. Preventive Maintenance for APPA Levels of Service

APPA Levels	Level 1	Level 2	Level 3	Level 4	Level 5
Description	Showpiece Facility	Comprehensive Stewardship	Managed Care	Reactive Management	Crisis Response
Preventive Maintenance Proportion of Work	100%	75-100%	50-75%	25-50%	0%

Source: Becker, T. and Bigger, A. (2011). Operational Guidelines for Educational Facilities: Maintenance (Second Edition), APPA: Leadership in Educational Facilities.

Management Response: *Management agrees with the recommendation. Staff from Educational Facilities working with Finance will develop a methodology to address facility asset management plans over the life cycle of the facility including asset renewal/major repairs as well as reduction of deferred maintenance. Preventive Maintenance actions will be addressed as found in the recommendations below.*

Target Completion Date: *Action Plan developed; requisite support, staff and resources identified – January 31, 2018*

Finding 3: Key Performance Indicators (KPIs) currently tracked by the Department are limited.

Unlike many school systems, ACPS’ Strategic Plan has a goal specifically focused on educational facilities. Including facilities functions in a school division strategic plan provides a direct connection to the broader organization’s mission and emphasizes the importance of facilities in the education process.

The ACPS 2020 Strategic Plan states:

Goal 4: Facilities and the Learning Environment - ACPS will provide optimal and equitable learning environments.

4.1 Optimal Learning Environments and Infrastructure - In collaboration with City partners, ACPS will move aggressively to modernize all learning environments, expand or otherwise adapt facilities to meet projected changes in school enrollment, and ensure equitable application of capital improvements throughout the school division.

4.2 Well Maintained Facilities - ACPS will ensure that facilities are maintained at high levels and that repair needs are addressed in a timely and efficient manner to support the educational mission and daily operations of the district.

4.3 Sustainable Facilities - ACPS will model sustainable environmental practices.

4.4 Safe and Secure Facilities - ACPS will ensure that its facilities are safe and secure.

4.5 Information Technology Infrastructure - ACPS will maintain an IT infrastructure within which an equitable distribution of resources provides support to every educational program and learning environment.

4.6 Outdoor Learning and Recreational Opportunities - ACPS will ensure its outdoor recreation and learning spaces are accessible and appealing to the community.

Other objectives in the ACPS 2010 Strategic Plan also connect to the Educational Facilities mission:

Goal 6: Effective and Efficient Operations: ACPS will be efficient, effective, and transparent in its business operations.

6.1 Fiscal Policies and Practices - ACPS will plan, manage, monitor, and report spending to provide decision-makers and the community with a reliable, accurate, and complete view of the financial performance of the educational system at all levels.

ACPS has established an initial set of Key Performance Indicators (KPIs) for assessing progress in attaining these goals, but they are limited and do not comprehensively address the strategic plan sub-goals.

Recommendation 2: Refine and expand key performance indicators (KPIs) and metrics for facilities management.

The Educational Facilities Department should review the current KPIs and consider adopting revised performance measures that more directly and comprehensively address the Strategic Plan sub-goals. In addition, ACPS should develop internal metrics that build to these KPIs and help monitor the performance of Department processes but are not reported at the KPI level.

Organizations at the forefront of their communities have developed best practices by using various approaches to track key performance indicators for measuring results. The audit team recommends instituting processes to track outcomes-based performance measures related to investments in maintenance and repair, including metrics related to compliance, condition, effective operations, and other stakeholder-driven outcomes.

Table 7 describes current ACPS KPIs, suggested revision to these KPIs, and recommendations for additional metrics that would be useful for managing the performance of Educational Facilities functions.

Table 7. Recommendations for KPIs and Metrics

Strategic Plan Goal	Current KPI	Recommended KPI	Recommended Metrics
4.1 Optimal Learning Environments and Infrastructure	4.1.1 - % of families and community members reporting that ACPS provides optimal learning environments (annual survey)	Retain 4.1.1 Add 4.1.2 – School capacity (goal of less than 100% at each school)	% building inspections with satisfactory results
4.2 Well Maintained Facilities	4.2.1 - % of projects/repairs addressed within established time-frames	Move 4.2.1 to “Other Metric for Managing Work” Change 4.2.1 to FCI by school (goal of no school rated as “Poor”)	% of projects/repairs addressed within established time-frames Maintenance funding (\$/GSF and % of CRV) PM completion rate (%) PM / CM mix (%) Change in FCI (as projects are completed)
4.3 Sustainable Facilities	4.3.1 - % change of energy usage per square foot 4.3.2 - Ratio of amount recycled to total amount of waste at TC Williams High School	Retain 4.3.1 Expand to include all schools in 4.3.2 as data are available	Utility cost/GSF
4.4 Safe and Secure Facilities	4.4.1 - % compliance with state-mandated safety drills (tornado, lock-down, fire, etc.)	Move current 4.4.1 to “Other Metric for Managing Work” Change 4.4.1 to “% schools with	% compliance with state-mandated safety drills (tornado, lock-down, fire, etc.)

Strategic Plan Goal	Current KPI	Recommended KPI	Recommended Metrics
	4.4.2 - % of students reporting never feeling afraid of being hurt in school as measured by the Developmental Assets Survey 4.4.3 - % of faculty reporting safe school environment on TELL survey	satisfactory external audit results for security” Retain 4.4.2 and 4.4.3	
4.5 Information Technology Infrastructure	(Not under the purview of the Educational Facilities Department)		
4.6 Outdoor Learning and Recreational Opportunities	4.6.1 - % of families and community members reporting satisfaction with ACPS outdoor recreation and learning spaces (annual survey)	Retain 4.6.1	% grounds inspections with satisfactory results
6.1 Fiscal Policies and Practices	6.1.2 - Accuracy of projections and utilization of fiscal resources: A. Percentage point different (sic) between actual fall enrollment and projected enrollment B. Actual annual expenditures as a percent of the revised operating budget C. Based on the approved budget at the time of contract execution, the number of major CIP projects reaching substantial completion within budget	Retain 6.1.2.A Move 6.1.2.B to “Other Metric for Managing Work” Retain 6.1.2.C and add “on time”	

Source: Gibson Consulting Group

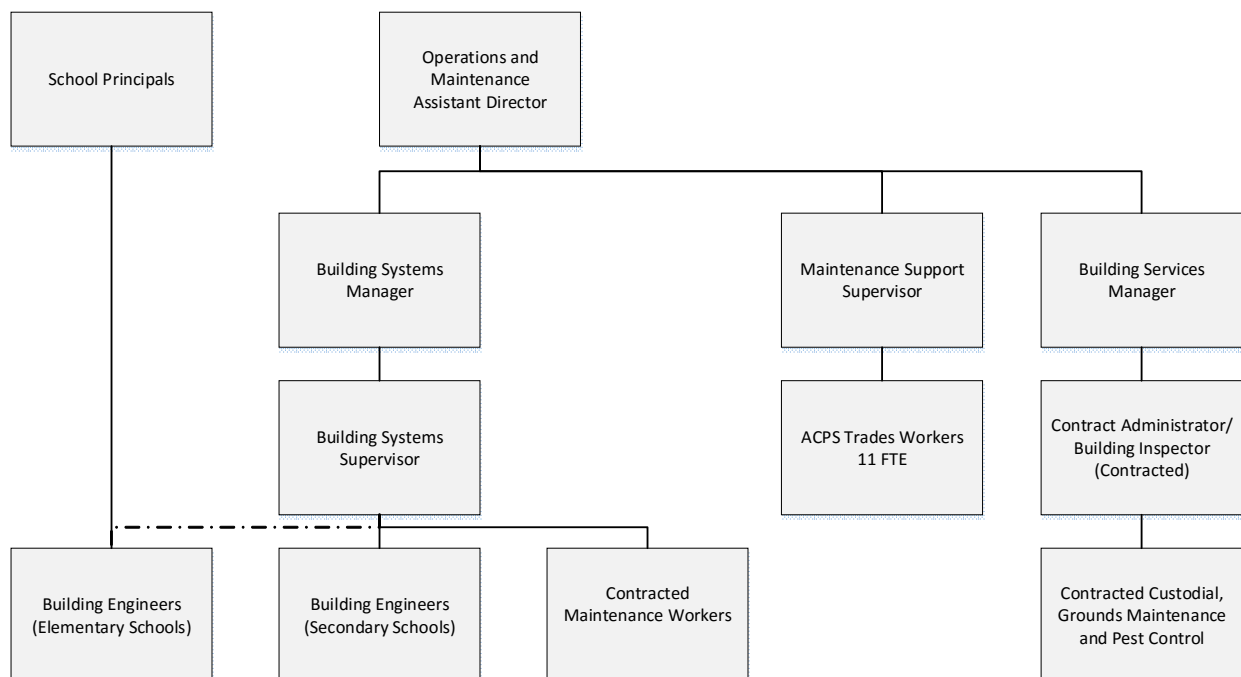
Management Response: *Management agrees with the recommendations. Staff from the Accountability Office, Educational Facilities and Finance will evaluate revisions to KPI's during the annual KPI review.*

Target Completion Date: *Evaluation during annual KPI review, Spring 2018*

Section 2 – Facilities Maintenance

The facilities maintenance function for all ACPS facilities falls under the purview of the Assistant Director for Operations and Maintenance and is comprised of 16 funded positions, including the Assistant Director, four managers or supervisors, and 11 trades' workers. The in-house workforce is augmented by contractors who perform the majority of the preventive and corrective maintenance actions needed to keep facilities functioning properly. The organizational structure for the ACPS facilities and maintenance function is shown in Figure 2.

Figure 2. ACPS Operations and Maintenance Function Organizational Structure



Source: Developed by Gibson Consulting based on departmental interviews

Contracts for operations and maintenance are solicited by trade and include these services:

- HVAC preventive and corrective maintenance
- Emergency generator testing and maintenance
- Elevator testing and maintenance
- Fire prevention system inspection and maintenance
- Roofing inspection and maintenance
- Kitchen hood cleaning
- Electrical services
- Plumbing services

- Trash compactor maintenance
- Pest control
- Landscaping and grounds maintenance
- Custodial services

Management and Oversight of Contracted Services

ACPS has adopted a maintenance model that uses a combination of building engineers and in-house trades workers for relatively minor maintenance and repair tasks, while outsourced contractors perform most of the preventative and corrective maintenance on its building systems. In 2015-16, *SchoolDude* records show that the total cost of work orders completed in-house was \$619,685, while procurement records showed that total cost of purchase orders issued to vendors for building maintenance and repair services using operations and maintenance funds exceeded \$3 million.⁹ These figures illustrate the relatively high reliance on contracts for maintenance services.

Finding 4: The Department does not systematically monitor the completion of all maintenance work performed by contractors nor document contractor performance.

A service delivery model that relies heavily on contracted service providers requires that systems and processes be in place to effectively monitor contractor performance. A review of a sample of the service contracts issued by ACPS for building maintenance and repair services showed that the contracts adequately describe the scope of services and performance expectations of the contractor; however, the Department does not systematically monitor the completion of all contracted services or document contractor performance, particularly if the work is not entered into *SchoolDude*.

ACPS does review some work that is performed by its contractors. For work orders that are requested through the *SchoolDude* system and assigned to a contractor, the Building Systems Supervisor is assigned the responsibility for field verification that the tasks were performed completely and correctly. Given the volume of work orders, only a sample of completed jobs are currently verified for completion. The Building Systems Supervisor or Building Systems Manager will sometimes contact the original requestor of the work or the school's Building Engineer to see if the contractor completed the tasks and corrected the issue. A final check of contractor completion of *SchoolDude* work orders occurs when the Executive Assistant (who oversees the *SchoolDude* system) reviews, on a monthly basis, the invoices submitted by contractors for work they performed. If an invoice is submitted and the work order is shown as "Open" in *SchoolDude* then the Executive Assistant will contact the Building Systems Manager to verify if the work was completed, and if so request that the Building Systems Manager complete and close the ticket in *SchoolDude*.

⁹ Request No 36_FY16 Operating POs and Expenditures

Recommendation 3: Institute a formal quality assurance oversight system for review of contracted facility maintenance and repair services.

ACPS should implement a more formal program for quality assurance and oversight of its contracted maintenance work. ACPS has hired a third-party contractor to perform quality assurance inspections for custodial, pest control, and grounds maintenance services. It is recommended that they also allocate an in-house resource or third-party contractor to provide the same type of oversight of facility maintenance contracts.

The quality assurance system should set clear expectations of roles and responsibilities of those executing the program. Program elements should include a review of all service contracts to capture contractor scope elements and performance standards; development of checklists for each contract to be used to formally document contractor performance; a clear description of acceptable methods for verifying work, such as site visits, phone interviews, or review of building monitoring system operating parameters based on the dollar value and criticality of the work performed; methods for compiling results and providing feedback to contractors for improved services; and, use of documented contractor performance results as a selection factor in future contract solicitations.

Management Response: Management agrees with the recommendation. Staff will explore the feasibility of funding an in-house resource or third-party contractor to provide oversight of facility maintenance contracts. Staff will develop quality assurance protocols addressing the elements identified above.

Target Completion Date: Action Plan developed to create program, necessary staff, support and resources identified -- December 15, 2017

Work Order Management System and Processes

Finding 5: ACPS is not using the full capabilities of *SchoolDude* to effectively manage all maintenance activities.

ACPS uses a web-hosted version of the *SchoolDude* computerized maintenance management system (CMMS) to automate and manage its work order processes. The use of *SchoolDude* has helped streamline the work request process, allowing requesters to initiate their own requests. However, as shown below, the configuration of some data fields does not allow for meaningful reporting on the work it is currently tracking in *SchoolDude*. In addition, information needed to fully manage the maintenance program is incomplete because ACPS has not implemented key capabilities available from *SchoolDude* that record the inventory of maintainable assets and capture all types of maintenance activities, such as routine and preventive maintenance. This limits management's ability to effectively oversee and manage the full spectrum of its maintenance work.

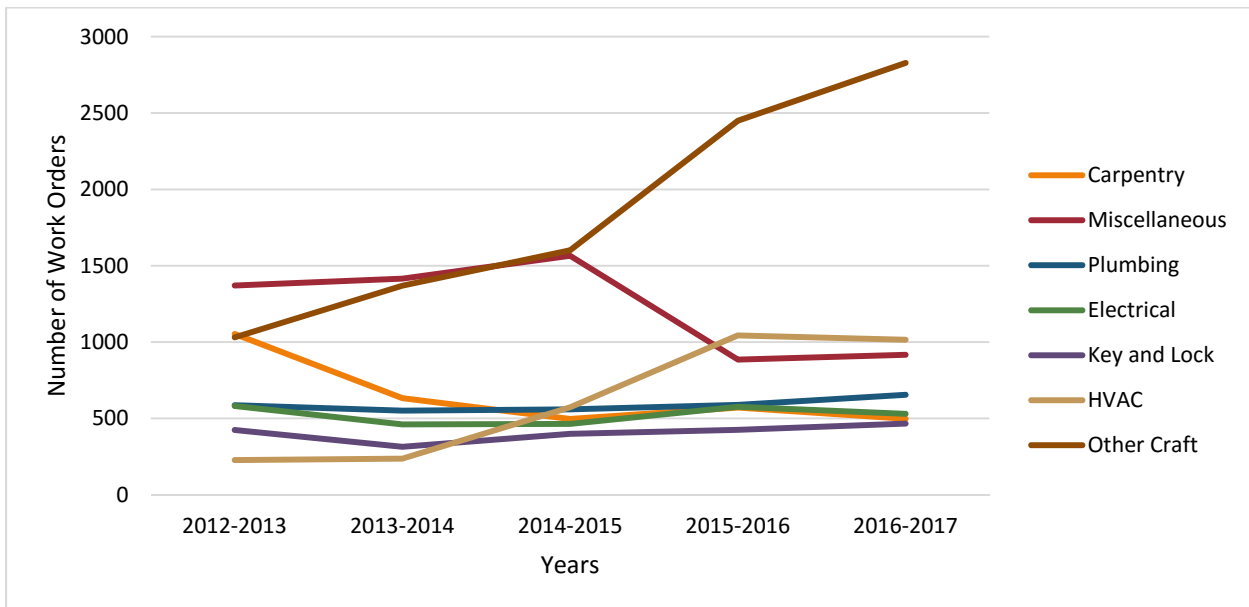
Table 8 shows the total number of work orders entered into *SchoolDude*, and Figure 3 shows the distribution of work order counts for the seven craft categories with the highest number of assigned work orders.¹⁰

Table 8. Total Work Orders Entered in *SchoolDude*

Measure	2012-13	2013-14	2014-15	2015-16	2016-17
Total Work Orders	5,282	4,982	5,659	6,541	6,928

Source: ACPS CMMS data.

Figure 3. Total Work Orders by Craft, 2013-2017



Source: ACPS CMMS data.

The upward trend in total work orders is a positive indication the system is being increasingly used to capture work as it is reported to Educational Facilities. However, the sharp increase in work attributed to “Other Craft” is concerning because it limits the ability of the Department to track and manage the work for both in-house staff and outsourced contractors.

The data reported above for the “Other Craft” category is an aggregation of the work orders assigned to any “Craft” besides the top six shown. From 2013 to 2015, there was a consistent list of 42 options for “Craft” and the number of tasks attributed to each of those options remained relatively steady over those three years. Beginning in 2016, 32 additional “Craft” options were introduced into *SchoolDude* and as shown in Figure 3 many work orders were assigned to these various new categories (mostly replacing work orders assigned to the Miscellaneous category). Table 9 shows the additional “Craft” options added.

¹⁰ Only partial data for the 2017 school year (through May 2017) was available at the time of the audit, so some analyses may not consider this school year.

Table 9. New “Craft” Options Added in *SchoolDude*

Craft		
Asbestos	Food Services	Paving
Asphalt	Fuel Delivery	Salt
Bleachers	Furniture	Scissor Lifts
Carpet Cleaning	Grounds Equipment Repair	Security Camera
Carpet Repair	Ice Machine Service	Shades/Blinds
Ceiling Tile	Mold Remediation	Signage
Clocks/Bells	Office Supplies	Smoke Detector
Contractor	Painting	Supplies
Curtain Repair/Cleaning	Parking Lot Striping	Welding
Delivery	Food Services	Kitchen Equipment
Field Trips	Fuel Delivery	Recycling

Source: ACPS CMMS data

The total list of 74 “Craft” options actually encompasses a combination of work trades and work tasks. It is recommended that this field be reconfigured to only allow for a limited number of traditional “Craft” types that align with ACPS maintenance work, such as Carpentry, Plumbing and HVAC. Other *SchoolDude* fields such as “Custom Category” or “Equipment Name” can be configured to provide an additional level of detail if needed for work management purposes.

Similarly, inventory data related to maintainable assets has not been entered into *SchoolDude*. Work orders are attributed to locations, not equipment assets. Without sufficient information related to which assets are being maintained or repaired, ACPS is limited in its ability to develop an accurate long-range equipment replacement plan that would be an essential component of the previously recommended facility management plan.

Another related issue is that the *SchoolDude* system is only being used to capture requested work. ACPS has not implemented the *SchoolDude* preventive maintenance (PM) scheduling module, and the “Purpose Description” field in the Maintenance Direct work management module is not being used to capture PM activities. This lack of PM data can be attributed to the fact that most PM work has been outsourced to specialty trade contractors and, with few exceptions, ACPS does not require contractors to enter this information into the system. ACPS’s contract for HVAC maintenance does require the contractor to enter completed PM work in *SchoolDude*, and ACPS stated its intent to add this requirement to future equipment maintenance contracts as they are renewed. Without reliable information about this total preventive and corrective maintenance workload, ACPS cannot accurately and proactively track or manage workloads.

Recommendation 4: Enhance the use of the SchoolDude to improve maintenance management and efficiency.

To improve the use of *SchoolDude*, the following actions should be taken:

1. Evaluate the costs of implementing the PM module of *SchoolDude* to validate that this expenditure will benefit the overall management of maintenance work.
2. Provide appropriate staffing to manage the *SchoolDude* system, either by reallocation of current staff duties or through a Work Controller position (a later recommendation in this report).
3. Develop a protocol to capture and account for contractor work that does not originate from a *SchoolDude* work order.
4. Validate equipment inventories and create records for all major maintainable assets, possibly as part of a facility condition assessment.
5. Identify performance measures to be tracked and reported using data available from *SchoolDude*.
6. Re-configure *SchoolDude* work order codes to enable generation of the desired performance measures (e.g., work order type codes, status codes and priority codes).
7. Document and train staff on consistent procedures to generate work orders, select the appropriate work type and category, track labor and materials, and update equipment records to maintain accurate records.

Management Response: *Management agrees with the recommendations. Staff will evaluate the feasibility of creating a more comprehensive work order system including establishing a work flow controller position, upgrades to SchoolDude and performance measures to be tracked and reported using SchoolDude data. Staff from Facilities, Procurement and Budget will explore protocols regarding contractor work. In addition, validation of equipment inventories and records of major maintainable assets will be included in the larger long term Facility Asset Management Plans (Refer to Recommendation #1).*

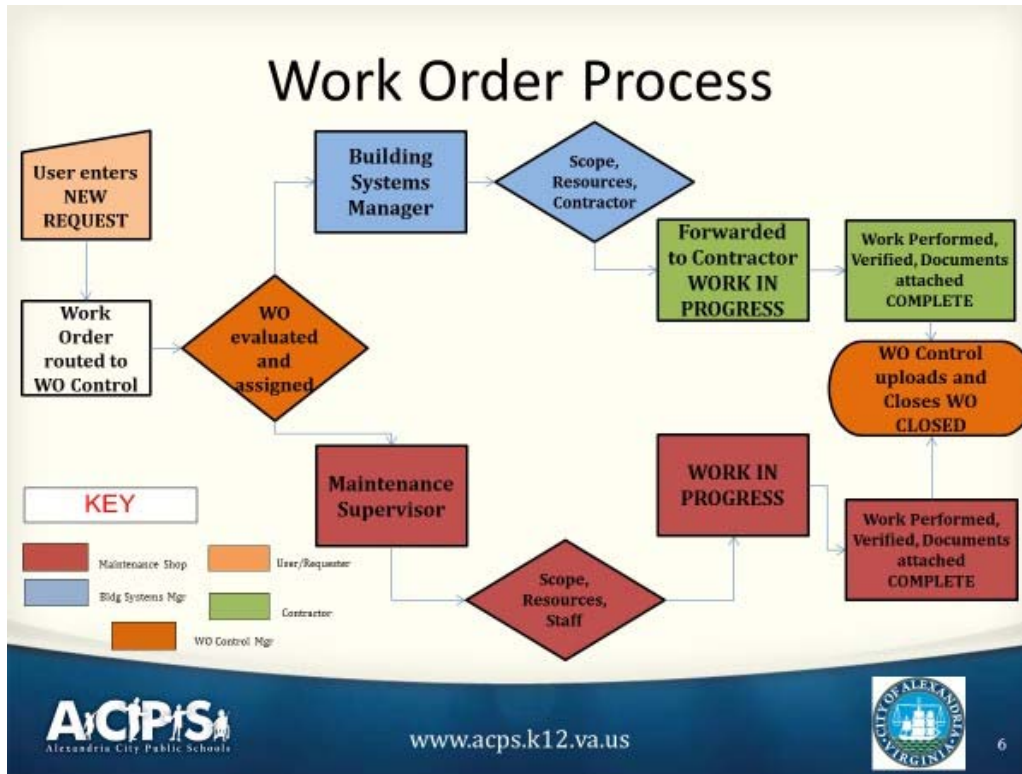
Target Completion Date: *Action Plan developed; support, resources, staff and funding identified -- January 31, 2018*

Finding 6: Educational Facilities tracks requested work, but is not systematically controlling and reporting on its work.

ACPS is primarily using *SchoolDude* to receive requests from customers for work ranging from minor repairs to moving boxes. Work requests entered by customers into the *SchoolDude* system, and other emails or calls received from customers, are monitored by the Department's Administrative Assistant. This position routes work orders based on a best estimate of the proper work assignment.

Figure 4 illustrates the work order process defined by ACPS for managing work orders.

Figure 4. Corrective Maintenance Work Order Process



Source: ACPS

While the Administrative Assistant is properly performing the work routing tasks that have been assigned to him by management, these functions are an adjunct to his principal role as an Administrative Assistant. There is no Work Controller position that is dedicated to the planning, controlling, coordination and reporting of the full ACPS maintenance workload.

The following tables and analyses drawn from ACPS *SchoolDude* work order data are indicative of work management information that would be useful for better managing and reporting on ACPS' work. Table 10 shows the number of *SchoolDude* work orders that were "Assigned To" each Skilled Maintenance Worker, General Maintenance Worker, and Building Engineer for the 2015-16 school year.¹¹ For these work orders, the audit team calculated the number of hours that were accounted for using the "Actual Hours" field in *SchoolDude* and determined the percentage of the total potential productive hours that were recorded on work orders. To calculate the percentage of productive hours recorded, it was assumed that each FTE staff member worked 2,080 hours per year, and that 65 percent (or 1,352 hours) would be

¹¹ *SchoolDude* records the "Assigned To" field by name, but names have been removed for reporting purposes. This analysis was conducted based on the position classifications and names shown in the ACPS files "Line 5 Position File.facilities-positon_roster-april2017" for maintenance worker names and "Detailed List of Custodial Staff and Work Schedule" for Building Engineer names.

a reasonable expectation for productive hours available each year (with the remaining 35 percent attributed to vacation, sick time, training, and other administrative duties).

The data show that the proportion of each employee’s productive work hours that are recorded in *SchoolDude* varied greatly. In general, the Skilled Maintenance Workers recorded a higher proportion of their productive hours in *SchoolDude* than did the General Maintenance Workers, and both groups far exceeded the productive work hours recorded by Building Engineers.

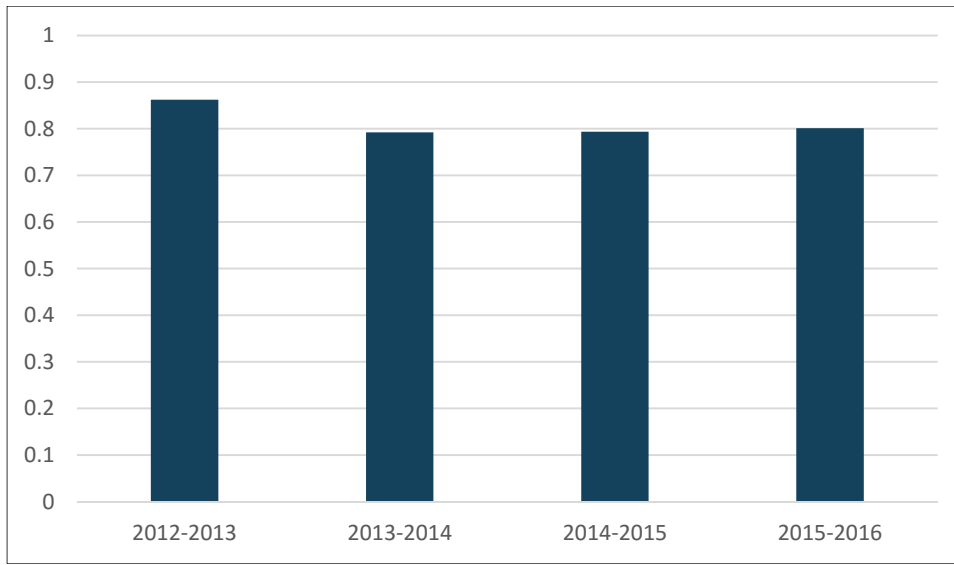
Table 10. Analysis of Work Orders by Employee, 2015-16

Classification	Number of Work Orders Shown as "Assigned To"	Hours Accounted for in Work Orders	Percentage of Productive Hours Accounted for in Work Orders ¹
Skilled Maintenance Worker 1	104	439.00	32.5%
Skilled Maintenance Worker 2	9	14.00	1.0%
Skilled Maintenance Worker 3	510	934.15	69.1%
Skilled Maintenance Worker 4	56	69.50	5.1%
Skilled Maintenance Worker 5	516	884.25	65.4%
Skilled Maintenance Worker 6	324	873.25	64.6%
Skilled Maintenance Worker 7	533	1,238.15	91.6%
Skilled Maintenance Worker 8	384	523.50	38.7%
<i>Subtotal Skilled</i>	<i>2,436</i>	<i>4,975.80</i>	<i>46.0%</i>
General Maintenance Worker 1	432	848.05	62.7%
General Maintenance Worker 2	36	78.15	5.8%
General Maintenance Worker 3	277	495.75	36.7%
<i>Subtotal General</i>	<i>745</i>	<i>1,421.95</i>	<i>35.1%</i>
Total Maintenance Workers	3,181	6,397.75	43.0%
Building Engineer 1	4	0.00	0.0%
Building Engineer 2	2	0.00	0.0%
Building Engineer 3	2	0.00	0.0%
Building Engineer 4	208	3.00	0.2%
Building Engineer 5	3	0.00	0.0%
Building Engineer 6	2	0.00	0.0%
Building Engineer 7	2	2.00	0.2%
Building Engineer 8	0	0.00	0.0%
Building Engineer 9	593	761.50	56.3%
Building Engineer 10	0	0.00	0.0%
Building Engineer 11	3	0.00	0.0%
Total Building Engineers	819	766.50	5.2%
Grand Total	4,000	7,164.25	24.1%

¹Assumes 1352 productive work hours available annually per FTE (2080 total hours, 65% direct productive hours)

Source: FEA analysis of ACPS Data

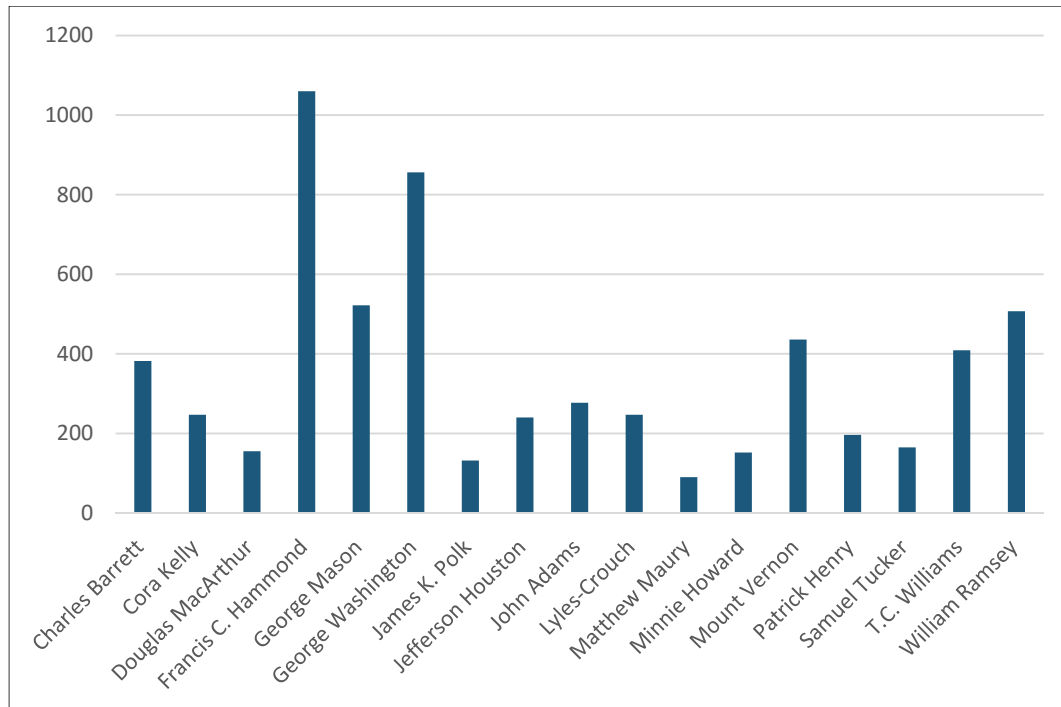
One reason for the low utilization is that not all in-house work orders have labor hours recorded. Figure 5 shows that for the past four years only about 80 percent of in-house work orders have actual labor hours recorded in *SchoolDude*. As a result, management does not have a complete understanding of how the in-house work force is being deployed or the effective utilization of their available direct labor hours. Ensuring that labor hours are recorded as work tickets should be one task that the Work Controller performs as a quality assurance and oversight of *SchoolDude* data.

Figure 5. Percentage of In-House Work Orders with Actual Labor Recorded

Source: ACPS CMMS data

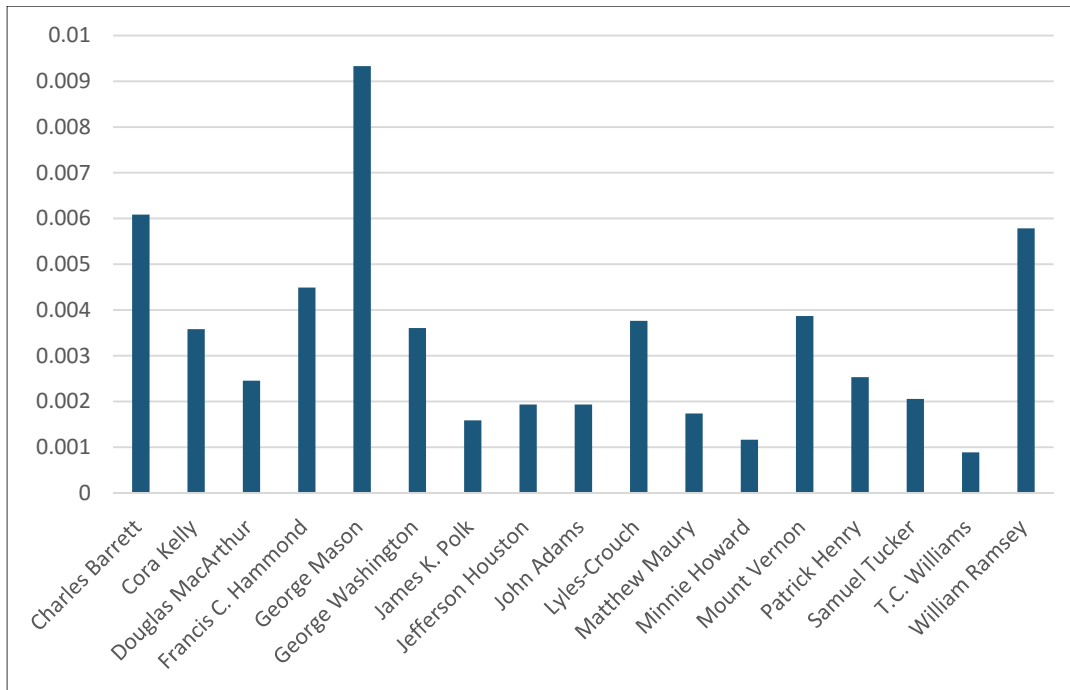
Building Engineers are rarely assigned to complete their work through the *SchoolDude* system. This reflects the fact that building engineer duties encompass many tasks that are not facility maintenance related, and that they work directly with school officials to receive many of their work assignments rather than using the *SchoolDude* system. The one exception was Building Engineer 9, who recorded over half their available productive hours on *SchoolDude* work orders. Upon closer examination of the work order data, it was shown that 586 of the 593 work orders “Assigned To” Building Engineer 9 had been “Requested By” himself. In other words, as Building Engineer 9 completed tasks at the school he would document the work he had performed by entering a work order assigned to himself. This practice is not one that has been prescribed by Educational Facilities, but it is recommended that it be adopted as a best practice. By capturing the maintenance work performed by Building Engineers, ACPS will increase the visibility of the total workload needed to maintain its schools and can make better decisions to optimize work order assignments by considering both Maintenance Workers, Building Engineers, and contractors as potential resources for completing work.

Figure 6 shows the number of work orders by school. Note that Francis Hammond Middle School also has “Building Engineer 9”, which explains why Hammond has so many more work orders than other schools.

Figure 6. Number of Work Orders by School, 2015-16

Source: ACPS CMMS data

Because ACPS schools vary greatly by size, the number of work orders per square foot was also analyzed. Figure 7 shows that George Mason Elementary School, Charles Barrett Elementary School, and William Ramsey Elementary have the highest number of work orders per square foot. Again, understanding the nature of the work orders would allow ACPS to proactively manage maintenance and preventative maintenance activities at each school.

Figure 7. Number of Work Order per Square Foot, 2015-16

Source: ACPS CMMS data

These are but a few examples of analyses that are available to be mined from *SchoolDude* data and used by Educational Facilities managers and supervisors for managing work.

Recommendation 5: Establish a Work Controller position (in-house or contracted) dedicated to work management oversight and reporting.

By dedicating a resource to function as a planner, scheduler, expeditor and proactive communicator on behalf of Educational Facilities, ACPS will improve its customer service, enhance its use of *SchoolDude's* capabilities, and improve work management performance and reporting. In addition to participating in the recommended improvement efforts for communicating with schools and enhancing the use of *SchoolDude*, the Work Controller position should also monitor performance and generate reports or metrics that would help Department supervisors and managers better manage facilities maintenance work.

Management Response: Management agrees with the recommendation. Staff will pursue establishing a Work Controller position dedicated to work management oversight and reporting.

Target Completion Date: Corollary to above; January 31, 2018

Customer Satisfaction

Finding 7: Customers are generally dissatisfied with the level of communication from the Department related to the status of maintenance requests and repairs.

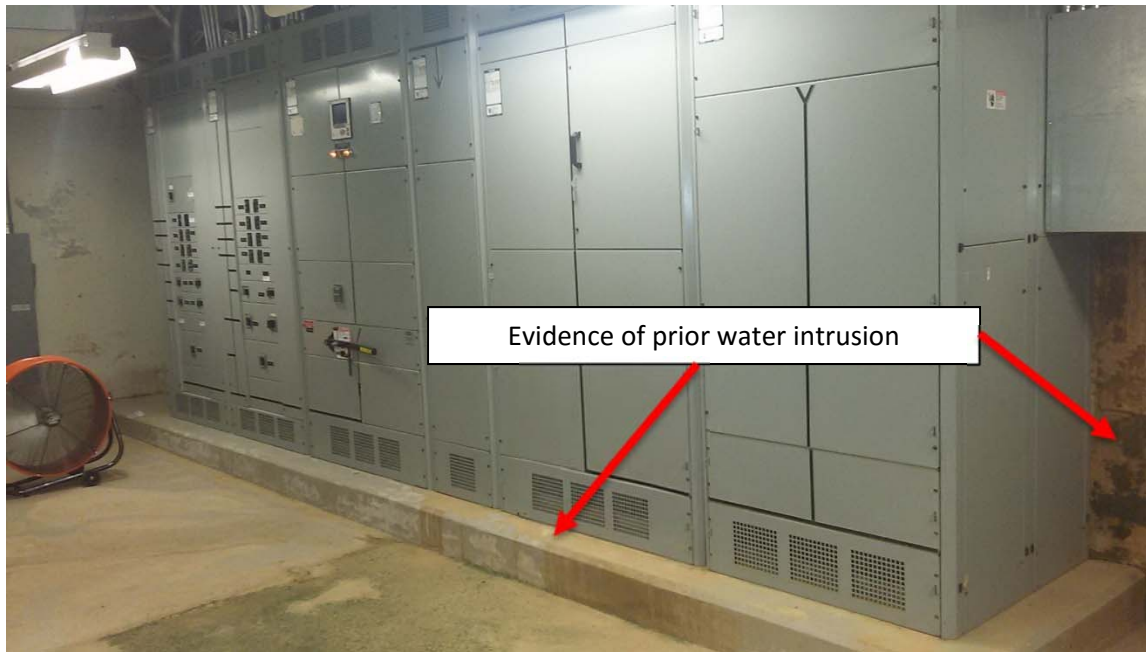
As part of this audit, the review team visited schools and conducted interviews with school principals and administrative staff to obtain feedback on the general satisfaction with services provided by ACPS maintenance staff and contractors. The interviews covered topics such as responsiveness, quality of work, service efficiency, condition of school interiors and exteriors, and reliability of building systems, among other things. Several key themes emerged during interviews with school officials.

First, there was a general perception that maintenance is reactive rather than proactive. The team heard several anecdotes from school principals of relatively minor problems becoming costly issues that impacted educational services because warning signs appeared to be ignored and problems were not corrected. For example, one principal described a scenario in which a minor roof leak was reported several times, but he wasn't made aware of any actions taken by maintenance staff. The ceiling in the affected area eventually collapsed, causing damage to items in the room and disrupting teaching in that area for several days until a repair corrected the leak and replaced the damaged ceiling. While the Maintenance Staff had actually been working with a roofing contractor to locate the source of the leak and institute a repair, they had difficulty identifying the leak source due to the age and construction of the building. That ongoing work was not proactively communicated to the principal. The result was a perception that nothing was done until the collapse occurred.

Another example of a reactive approach to communicating about facility repairs was the observation of water damage in the basement at George Mason Elementary School. Evidence of water intrusion was seen near the electrical service distribution equipment, and a fan in the room was apparently placed there to maintain ventilation and keep the areas dry (see Photo 1). The principal had not been informed of what steps were planned to be taken to correct the root cause of the problem.¹²

¹² ACPS staff later informed the audit team that a CIP building envelope project had been completed at this school, but it had not addressed the basement leakage.

Photo 1. Water Intrusion at George Mason Elementary School Basement



Source: Gibson Consulting Group

While the scope of this audit did not include engineering investigations or facility condition assessments, the audit team did observe that the basement water intrusion may be connected to a questionable repair outside of the building and directly above the basement wall where water intrusion has occurred. An extension to a roof drain down spout had been placed in an attempt to direct water away from the building, but the drain pipe extension had a hole in it and was routed in such a way that water would have to travel uphill in order to drain (Photos 2 and 3).

Photos 2 and 3. Drainage Downspout Above Basement Wall



Source: Gibson Consulting Group

At two other schools, the audit team observed electrical circuits that had been “locked out” for an extended period, and neither principal had been informed of what the resolution to the situations would be. According to ACPs’ Standard Operating Procedure Safety Manual, lockout devices are intended to be used to protect employees from injury caused by unexpected start-up or release of stored energy when performing maintenance on certain equipment. Once the maintenance is complete, the lockout device is to be removed and the equipment returned to service. Photo 4 shows a circuit that had been locked out since 2011, and Photo 5 shows a circuit that had been locked out for an unknown amount of time (though the principal believed it had been over three years). In neither case was there any knowledge of a plan to repair the equipment in question or permanently disconnect electrical service so that the lockout devices could safely be removed.

Photo 4. Lockout Device Applied at Samuel Tucker Elementary School



Photo 5. Lockout Device Applied at George Mason Elementary School



Source: Gibson Consulting Group

In addition to concerns about the lack of communication about correction of known problems, several principals expressed frustration with an over-reliance on the *SchoolDude* work order system as a communication tool. Some were not receiving automated notifications from *SchoolDude* when the status of work orders changes as they moved through the system, which then required them to log in to *SchoolDude* to determine the work order status. There were also several complaints from schools about tickets being closed in *SchoolDude* without the work being completed (as best they could tell), and with no communication from Educational Facilities staff as to why the work order ticket was closed.

Recommendation 6: Implement a system to proactively communicate with school principals about facility maintenance activities and issues.

An important part of maintaining customer satisfaction is understanding customer needs, setting clear expectations for performance, and proactively communicating about work in progress. To improve customer satisfaction levels, it is recommended that the Department develop and submit a monthly report to school principals summarizing the status of all open and closed work orders, as well as any upcoming major renovation projects. Further, the Department should annually survey school principals to assess their overall satisfaction with the quality of work performed by both in-house and contracted service providers, as well as Department staff. Satisfaction levels can be measured over time and included in the Departments list of KPIs.

Management Response: Management agrees with the recommendation. Staff will develop a monthly reporting format to be shared with Principals. Staff will pursue appropriate resources to develop a Customer Satisfaction survey.

Target Completion Date: Action Plan developed; requisite resources and staff identified - January 31, 2018

Energy Management

Finding 8: ACPS does not have an organized or measured energy management program.

The ACPS Energy Conservation and Building Management Regulation (Board Policy FA-R) provides guidelines for building energy and water use (required conservation practices, temperature set points, etc.), but it does not identify who is responsible for managing the ACPS energy program nor does it describe any measurement or compliance mechanisms.

ACPS performs a number of independent activities that relate to energy management, but these individual actions are not organized around any strategy nor are they routinely measured and monitored for effectiveness. For example, one project manager in the Planning, Design & Construction branch is focused on identifying and implementing energy efficiency projects such as LED lighting retrofits. He also analyzes utility bills and rate structures to seek opportunities for cost savings through initiatives with utility providers. Energy consumption and cost data are collected by building, and ACPS has begun using this data to manage energy performance. However, there is no programmatic effort to plan, implement, and measure results of consumption reduction or energy cost savings from these energy efficiency activities.

The ACPS 2020 Strategic Plan includes a KPI of “percent change of energy usage per square foot” as a measure of the goal to model sustainable environmental practices. The baseline for measuring consumption was established in the 2015-16 Scorecard (the most recent published), and a consumption reduction goal of 5 percent by 2020 was set. This reduction goal of 1.25 percent per year is modest, as some organizations target as much as 2 or 3 percent consumption reductions per year. However, without an energy management program in place, a designated position to oversee it, and measurable initiatives

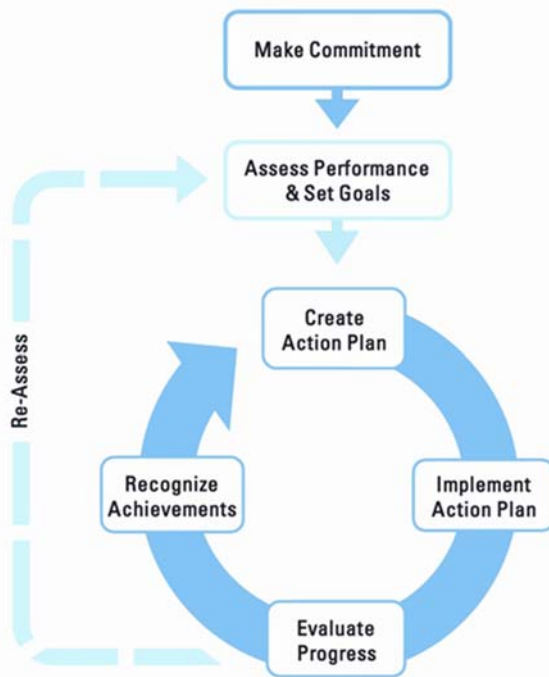
and tactics to achieve program objectives, it is unclear how ACPS expects to reduce its energy usage at any level.

Recommendation 7: Designate an Energy Manager and establish an Energy Management Program.

It is recommended that ACPS designate an Energy Manager from within the Department of Educational Facilities with the authority, responsibility and accountability to establish and execute a formal energy management program. This position should lead efforts related to creating action plans, implementing these plans, and monitoring progress toward achieving ACPS energy reduction goals.

The U.S. Environmental Protection Agency (EPA) offers a proven model for starting an energy management program through its ENERGY STAR initiative. Publicly available resources provide the steps for creating an energy management program focused on continuous improvement of energy performance, how to make the business case for investing organizational resources in energy efficiency efforts, and strategies and incentives for financing energy projects.¹³ Figure 8 provides an overview of the ENERGY STAR approach to continuous improvement in energy management.

Figure 8. EPA Roadmap for Strategic Energy Management

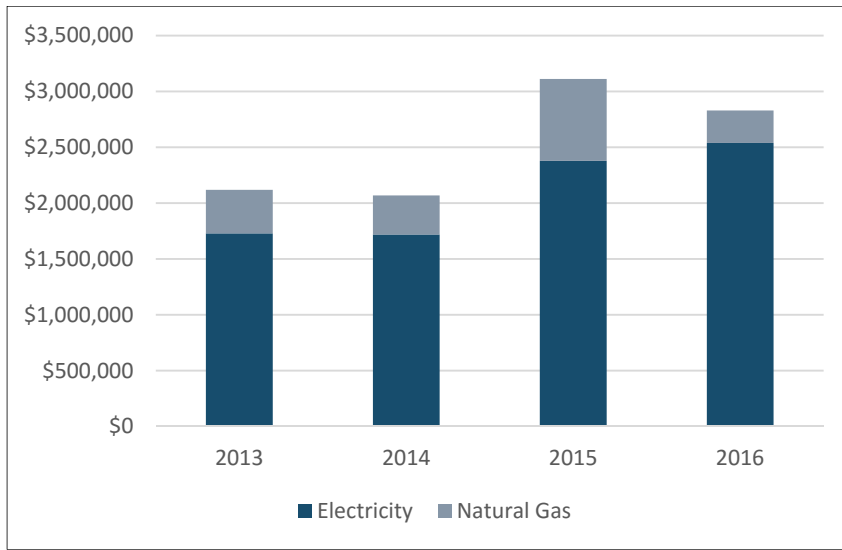


Source: U.S. EPA (<https://www.energystar.gov/buildings/about-us/how-can-we-help-you/build-energy-program/guidelines>)

¹³ <https://www.energystar.gov/buildings/about-us/how-can-we-help-you/build-energy-program>

Data provided by ACPS show that from 2013 through 2016 the Department spent between \$2 million to \$3 million per year on electricity and natural gas at schools and other ACPS facilities (see Figure 9).¹⁴ If ACPS implements an energy management program and achieves its consumption reduction goal of 1.25 percent per year, it has the potential to save between \$100,000 and \$150,000 in energy costs by 2020 (assuming relatively steady utility rates). If ACPS were to increase its reduction targets and successfully achieve them, then projected savings would increase proportionally.

Figure 9. ACPS Purchased Energy Costs



Source: ACPS (Energy Usage 2013-2016)

Management Response: Management agrees with the recommendation. Staff will designate an Energy Manager with the responsibility and authority to establish and execute a formal energy management program.

Target Completion Date: Action Plan developed and coordinated with HR – December 15, 2017

¹⁴ Energy consumption and cost data included the 17 buildings that comprise the 16 ACPS schools, plus the Transportation Facility, Rowing Facility, Chance for Change, and Maintenance Facility.

Section 3 – Custodial Services

The ACPS Department of Educational Facilities custodial services function is responsible for cleaning 2.2 million square feet in 12 elementary schools, 2 middle schools, 1 K-8 school, 1 high school (with 2 campuses), and 3 other non-school facilities. Since 2007, ACPS has increasingly backfilled in-house custodial services with contracted services. Currently, 10 of the school division's 21 facilities are served by two custodial contracts: Associated Building Maintenance (ABM) and Southeast Services Corporation (SSC).

Custodial Services Expenditures

Table 11 shows the Department of Educational Facilities total expenditures on custodial operations for 2014, 2015, and 2016. Total central office expenditures have increased 5.9 percent over the past 3 years, primarily driven by a 17.8 percent increase in contracted services. ACPS intermittent custodians (i.e., part-time) are reported centrally; however, ACPS full-time custodial staff are reported on school budgets and those expenditures are shown separately in Table 12.

Table 11. Department of Educational Facilities Custodial Operations Total Expenditures, 2014-2016

Object	2014	2015	2016	3 Year Δ
Personnel Salaries	\$386,186	\$339,928	\$328,225	-15.0%
Benefits*	\$124,524	\$76,173	\$71,426	-42.6%
Purchased Services	\$1,276,367	\$1,351,457	\$1,503,536	17.8%
Materials and Supplies	\$348,122	\$351,088	\$356,982	2.5%
Total Expenditures	\$2,135,199	\$2,118,646	\$2,260,169	5.9%

Source: ACPS Department of Educational Facilities, Operating Budget and Expenditures. *Benefits were estimated by multiplying the actual percent of benefit expenditures for Educational Facilities by the Personnel Services costs for custodial operations only for each fiscal year.

Table 12. ACPS School-Reported Custodial Staff Expenditures, 2014-2016

Object	2014	2015	2016	3 Year Δ
Salaries	\$1,801,650	\$1,796,466	\$1,711,022	-5.0%
Benefits	\$778,333	\$798,278	\$702,217	-9.8%
Total Expenditures	\$2,579,983	\$2,594,744	\$2,413,239	-6.5%

Source: ACPS Department of Educational Facilities, Custodian FY14-16 Actuals.xlsx.

Finding 9: The custodial services average cost per square foot and the average cost per student varies widely across schools within school levels, and overall these costs are highest for ACPS non-contract schools.

Table 13 details the fiscal year (FY) 2016 cost of custodial services for each campus, organized by service provider. Overall, ACPS non-contract schools average cost per square foot (\$2.24) is 32 percent higher than ABM and 44 percent higher than SSC contract schools. Similarly, the average cost per student for

ACPS non-contract schools (\$309.41) is 46 percent higher than ABM and 35 percent higher than SSC contract schools.

Within school levels, the average cost per square foot varies by as much as 56 percent at the 13 elementary schools, 15 percent at the two middle schools, and 43 percent at the two high school campuses. The average cost per square foot also varies even for schools using the same service provider. For example, the average cost per square foot of ACPS non-contract elementary schools varies by as much as 28 percent between John Adams Elementary School (\$2.28) and Samuel Tucker Elementary School (\$2.92). The average cost per square foot at the 4 ABM elementary schools varies by 30 percent between the schools with the highest and lowest cost per square foot. The average cost per square foot at the 3 SSC elementary schools is much more equitable, with just a 4 percent difference between the schools with the highest and lowest cost per square foot schools.

The average cost per student follows a similar pattern, with variation in costs across service providers and within school levels.

Table 13. Total Expenditures per School on Custodial Services, 2016

Campus	2016-17 Enrollment	2016 Bldg. SF	FY16 Expenditures	Cost per SF	Cost per Student
ACPS (Non-Contract)					
Charles Barrett ES	485	70,844	\$180,614	\$2.55	\$372.40
Douglas MacArthur ES	704	63,120	\$161,422	\$2.56	\$229.29
John Adams ES	994	143,290	\$326,100	\$2.28	\$328.07
James K. Polk ES	773	83,230	\$192,204	\$2.31	\$248.65
Samuel Tucker ES	790	80,180	\$233,842	\$2.92	\$296.00
Francis C. Hammond MS	1,409	236,125	\$453,774	\$1.92	\$322.05
George Washington MS	1,333	237,332	\$524,796	\$2.21	\$393.70
Minnie Howard HS	1,077	130,435	\$267,897	\$2.05	\$248.74
Total ACPS	7,565	1,044,556	\$2,340,649	\$2.24	\$309.41
Associated Building Maintenance (ABM)					
Cora Kelly ES	410	69,000	\$89,437	\$1.30	\$218.14
George Mason ES	555	55,935	\$94,778	\$1.69	\$170.77
Matthew Maury ES	417	51,800	\$77,447	\$1.50	\$185.72
William Ramsay ES	908	87,650	\$123,198	\$1.41	\$135.68
Chance for Change Alt.*	n/a	10,010	\$35,086	\$3.51	n/a
Total ABM	2,290	274,395	\$419,945	\$1.53	\$168.06
Southeast Services Corporation (SSC)					
Lyles-Crouch ES	436	65,645	\$92,410	\$1.41	\$211.95
Mount Vernon ES	881	112,730	\$159,883	\$1.42	\$181.48
Patrick Henry ES	653	77,400	\$105,575	\$1.36	\$161.68
Jefferson-Houston K-8	554	124,000	\$157,269	\$1.27	\$283.88
T.C. Williams King Street HS	2,677	461,147	\$534,805	\$1.16	\$199.78
Total SSC	5,201	840,922	\$1,049,941	\$1.25	\$201.87

Source: ACPS Department of Educational Facilities, Total Operating Budget and Expenditures, and Custodian FY14-16 Actuals.xlsx. *Enrollment figures were not available for Chance for Change Academy, as it is an alternative school where enrollment fluctuates monthly.

For the contract period June 30, 2016 through October 1, 2017, ABM has a contract amount of \$457,948.26 for the initial year, then a not-to-exceed amount of \$610,597.68 for every year thereafter. For the same time period, SSC has a contract amount of \$1,181,313.50 for the initial year, then a not-to-exceed amount of \$1,540,174.14 for every year thereafter.

Recommendation 8: Continue with the Department's long-term plan to reduce in-house custodial operations through attrition, and re-evaluate the cost structures of contracted service providers.

The Department acknowledges that the cost of in-house custodial operations far exceeds that of contracted service providers, and intends to reduce these positions over the long-term through attrition.

Regarding contracted services, both ABM and SSC have performance-based contracts, which means that contractors must meet certain measurable performance standards and requirements. Although some variations in the cost per square foot are expected due to facility age and structure, grade levels, number of students, and program requirements (to name a few), wide variations in cost per square foot and cost per student (particularly across schools within the same level) indicate a need for further review to better understand the drivers of those cost differences and whether or not they are warranted.

***Management Response:** Management agrees with the recommendation. Staff will continue the long term plan of contracting for custodial services through attrition. Staff will continue to evaluate cost and quality of services in contracted facilities.*

***Target Completion Date:** On-going; Contract 1 additional school for custodial services – December 15, 2017*

Custodial Services Organizational Structure and Staffing

Custodial services are provided by both ACPS division employees as well as two contracted service providers: Associated Building Maintenance and Southeast Services Corporation. Oversight of all custodial services operations is performed by the Building Services Manager, who reports to the Assistant Director of Operations and Maintenance. The Building Services Manager oversees all in-house and contracted services work relating to efficient and effective building services in all school facilities, including custodial operations, grounds maintenance, pest control, and other services as assigned.

The Building Services Manager is supported by a Contract Administrator/Building Inspector position (a contracted position), who is primarily responsible for supervising and inspecting work performed by outside contractors to verify that work performed is consistent with contract requirements and work standards before authorizing payment of invoices. Per the ACPS contract requirements, both ABM and SSC have a dedicated Custodial Services Supervisor position responsible for hiring, training, and supervising contracted custodial staff, and serving as the primary liaison for all communications to the Contract Administrator/Building Inspector and the Building Services Manager.

All ACPS schools are staffed with full and part-time custodians that work either a daytime or nighttime shift. Daytime custodians are primarily responsible for opening up the school building, cleaning the cafeteria after breakfast and lunch periods, spot cleaning restrooms and other areas as needed, arranging furniture in support of classroom activities and events, clearing snow from sidewalks, and performing light maintenance duties as needed (e.g., changing lightbulbs). Nighttime custodians are responsible for cleaning all areas of the school building, as well as the set-up and tear-down of furniture for after-school events. Head custodians are responsible for overseeing and training assigned custodial staff, maintaining supplies and equipment, preparing reports, and inspecting and securing facilities and grounds to ensure that they are suitable for safe operations.

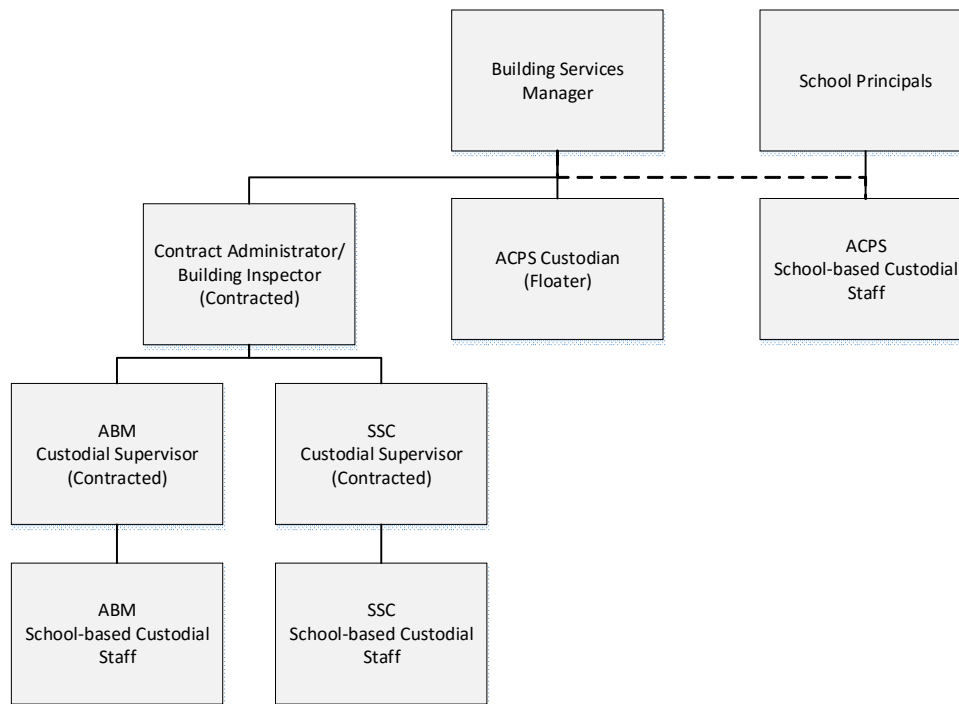
Most schools also have Building Engineers who are primarily responsible for performing routine and preventative maintenance activities, as well as verifying contractor performance. At the elementary

school level, however, Building Engineers function in a similar role as a head custodian (except they work a daytime shift), and are therefore included in the custodial services staffing analysis. Six of the 12 elementary schools have 1 FTE Building Engineer position, 2 elementary schools have .33 FTE Building Engineer positions, and 4 elementary schools do not have a Building Engineer.

ACPS in-house custodial staff report to the school principal, while contracted custodial staff report to their respective Custodial Services Supervisor. ACPS also has one custodian that is centrally reported and is responsible for cleaning the district’s non-school facilities and serving as a “floater” when ACPS custodians are absent.

Figure 10 provides an overview of the custodial services management and reporting structure.

Figure 10. Educational Facilities Department Custodial Services Organizational Structure



Source: Developed by Gibson Consulting based on departmental interviews.

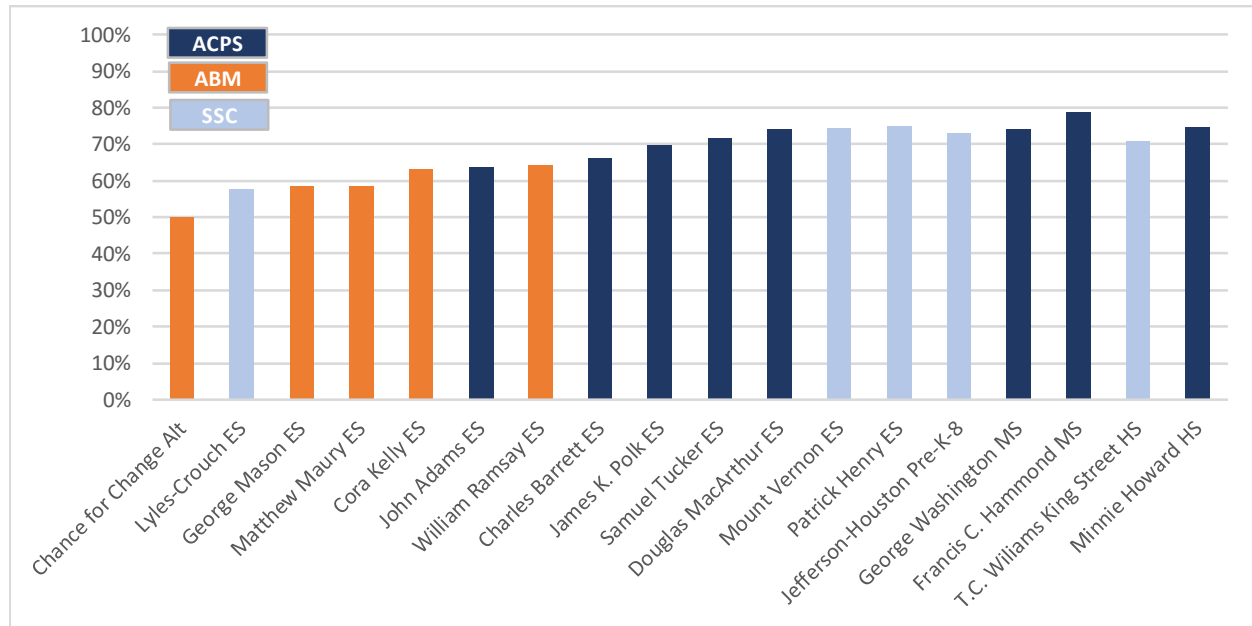
Commendation 2: ACPS has a dedicated position responsible for the management and oversight of contracted custodial operations.

Effective oversight and management is essential to ensuring that contracted services are provided in accordance with the provisions specified in the contract. ACPS has a dedicated position, the Contract Administrator/Building Inspector, who is responsible for the management and oversight of all custodial operations, including inspecting the work performed by outside contractors to verify that it is consistent with contract requirements and work standards before authorizing payment of invoices.

Commendation 3: The majority of custodians are staffed during the nighttime, which is best practice.

Figure 11 shows the percentage of nighttime custodians at each ACPS school. Although it is essential to have daytime custodial staff at every school to respond to staff and student needs, deep cleaning of a facility is most efficient during non-student hours. Small schools often find it more difficult to staff custodians at nighttime, simply due to the fact that they have fewer custodial positions to allocate. ACPS utilizes part-time custodians to give schools added flexibility to assign custodians to nighttime shifts or in a way that best meets each school’s needs.

Figure 11. Percent of Nighttime Custodians



Source: ACPS Department of Educational Facilities, Executed Custodial Services Contracts for ABM and SSC (October 1, 2016 thru June 30, 2017).

Finding 10: ACPS in-house custodial staffing levels are inefficient and workloads vary widely across schools.

The number of custodial staff at each building is dictated by expectations for cleanliness and sanitation, the building’s physical layout, student enrollment, program space needs, and community use of schools. According to the Building Services Manager, ACPS strives to maintain a Level 2 standard of cleanliness as described by the Association of Physical Plant Administrators Leadership in Educational Facilities, and has established staffing guidelines of 20,000 to 23,000 building square feet per custodian and 132 students per custodial FTE to meet this standard.

Various national organizations have established guidelines and benchmarks for the number of cleaning staff, usually based on building square footage. The *Planning Guide for Maintaining Public School Facilities*, developed by the Schools Facilities Maintenance Task Force and the Association of School Business Officials, establishes a standard that a nighttime school custodian should be able to clean between 28,000 and 31,000 square feet per each 8-hour shift to keep school areas clean. With day shift and night shift

combined, many school systems are able to achieve an aggregate coverage ratio of 22,500 square feet or more per custodial FTE. The Council of Great City Schools in its *Managing for Results in America's Great City Schools 2016* benchmark report shows a range of 22,512 (lower quartile) to 25,451 (median quartile), to 30,500 (upper quartile) building square feet per custodial FTE.

Table 14 provides a summary of ACPS' custodial FTE (calculated by Gibson based on the number of hours per shift per custodial staff position), the average building square feet per custodial FTE, the average of building square feet per nighttime custodial FTE, and the total number of students per custodial FTE.

Table 14. ACPS Custodial Staff (Non-contract Schools), 2016-17

Campus	Custodial FTE*	Nighttime FTE	Bldg. SF per FTE	Bldg. SF per Nighttime FTE	Students per Custodial FTE
Charles Barrett ES	5.4	3.4	13,180	20,991	90
Douglas MacArthur ES	7.2	5.2	8,782	12,168	98
John Adams ES	9.3	5.8	15,387	24,652	107
James K. Polk ES	6.2	4.2	13,451	19,876	125
Samuel Tucker ES	6.6	4.6	12,103	17,336	119
Francis C. Hammond MS	11.3	8.8	20,873	26,794	125
George Washington MS	11.5	8.7	20,638	27,319	116
Minnie Howard HS	7.4	5.4	17,686	24,267	146
Total ACPS	64.9	46.1	16,101	22,677	117

Source: ACPS Department of Educational Facilities, Detailed list of custodial workload and staff.xlsx.

Note: Building Engineer positions are included in staffing analysis at elementary schools only. *Custodial FTE is calculated based on the number of shift hours per custodian, whereby 8 hours is equal to 1 FTE.

As shown in Table 14, the overall average building square feet per custodial FTE is 16,101, which is well below the of the industry standard and benchmarks previously referenced, including ACPS' established guideline of 20,000 to 23,000 building square feet per custodial FTE. Custodial staffing is most inefficient at elementary schools, where the average building square feet per custodial FTE is just 12,581. The average workload for nighttime custodians is slightly more efficient at 22,677 building square feet, but is still well-below the industry standard of 28,000 to 31,000 building square feet. At the elementary level, nighttime custodial workload varies by as much as 50 percent, from 12,168 building square feet at Douglas MacArthur Elementary School to 24,652 building square feet at John Adams Elementary School.

Because some schools are at or above their enrollment capacity, ACPS also monitors the number of students per custodial FTE, which ranges from a low of 90 at Charles Barrett Elementary School to a high of 146 at Minnie Howard High School—a 60 percent differential. Even within the elementary school level, the number of students per custodial FTE varies by as much as 39 percent.

Together, these two benchmarks suggest that ACPS has an opportunity to increase staffing efficiency and equity, and to reduce costs, particularly at the elementary schools. However, since ACPS custodians and Building Engineers are reported on school budgets, the Department is limited in its ability to reallocate resources across schools.

Recommendation 9: Have ACPS custodians and Building Engineers report centrally to the Building Services Manager rather than to school principals.

Centralized oversight of these school-based positions will allow the Educational Facilities Department to have more autonomy and greater flexibility to ensure that staff are allocated efficiently and equitably across schools.

Management Response: Management agrees with the recommendation. Staff will develop a staffing plan as well as additional resources required for ACPS custodians and Building Engineers to report to Educational Facilities.

Target Completion Date: Phased Action Plan developed in conjunction with Finance, HR and Facilities – February 28, 2018

Recommendation 10: Reduce custodial FTE at non-contract schools to bring workloads more in line with industry standards for staffing efficiency at all schools.

ACPS staffing guidelines do not represent industry standards and are not consistently applied. The current approach to staffing custodians at ACPS non-contract schools is based on historical levels and does not ensure equity of workloads and optimal utilization of staff across schools. ACPS should continue to pursue its longer-term objective to fully outsource custodial operations (discussed previously). In the short-term, ACPS should continue to reduce the number of custodial positions through attrition, and reallocate positions across schools to balance workloads.

Management Response: Management disagrees with the recommendation in part. Staff believes the current in-house staffing is consistent with the square footage, student population and grade level of schools. Management agrees that the ACPS long-term plan is outsourcing of custodial services.

Target Completion Date: Ongoing. See also Recommendation #8.

Management Practices

Commendation 4: The Educational Facilities department has established cleanliness standards, cleaning frequency standards, and procedural standards, and routinely monitors schools to ensure that they are adhered to.

The Department has adopted the Level 2 (Orderly Tidiness) standard of cleanliness prescribed by the APPA. These cleanliness standards, along with cleaning frequency standards and cleaning procedures, are communicated during the Annual Custodian Refresher Training course, which is mandated for all ACPS custodial staff. These standards are also included in the ABM and SSC custodial contracts. All nighttime custodians, regardless of service provider, follow zone cleaning procedures whereby each custodian is responsible for all cleaning activities (e.g., dusting, vacuuming, trash removal, washing floors) in a particular area, or zone. This method of cleaning supports individual accountability.

ACPS also has an established performance monitoring system, whereby weekly inspections are conducted at every school to ensure that cleanliness standards are met. Results are noted on a Weekly Inspection Report Card, which is reviewed with the head custodian at each school so that any deficiencies are addressed in a timely manner.

Section 4 – Grounds Management

ACPS grounds are maintained by an outsourced contractor for courtyards, gardens, flower beds, and landscaped areas adjacent to each school. Grounds maintenance activities include mowing, planting, weeding, fertilizing, small tree maintenance, and litter control. The total acreage maintained by the contractor has not been calculated by ACPS and is not defined in the contract documents. However, the contract does include aerial maps (not to scale) that clearly define the service area boundaries and expected services for each of the 17 parcels to be landscaped by either the contractor or the City.

Total ACPS 2016 expenditure on grounds and tree maintenance services were \$77,617. Note that this amount only represents ACPS' portion; the vast majority of the grounds maintenance activities are provided by the City through a Memorandum of Understanding (MOU).

Commendation 5: Grounds upkeep services operate efficiently and effectively.

Oversight of the landscaping contractor is performed by the same contracted position responsible for overseeing outsourced custodial and pest management services at each school. In addition to observing the contractor's work, this position is also responsible for discussing any contractor performance issues with the contractor and school officials during school visits. Figure 12 is an example of a monthly report that is compiled to document that the contractor has satisfactorily completed required tasks each month.

Figure 12. Example Landscape Performance Report



Detailed Inspection

Landscape Performance Report

Date: May 31, 2017

Inspected by: Glods Alberto

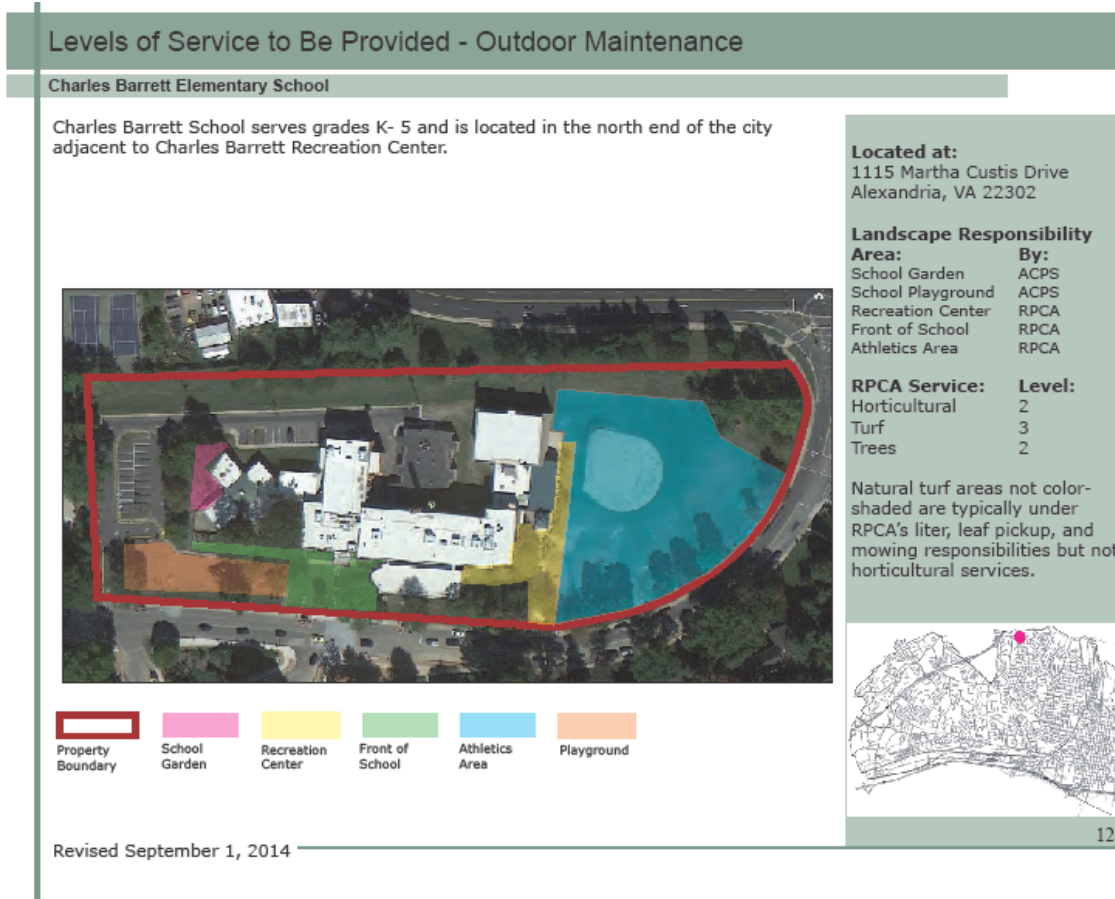
Contractor: Bright View

Schools	Address of site/Location	Weekly Visits (roughly 22visits per growing season)	# Occ completed
John Adams ES	651 Ray bum Ave, 22311	Performed	2
Patrick Henry	4643 Taney Ave, 22304	Performed	2
Cora Kelly	3600 Commonwealth, 22305	Performed	2
Mount Vernon	2601 Commonwealth Ave, 22305	Performed	2
James K Polk	5000 Polk Ave, 22304	Performed	2
Francis Hammond	4646 Seminary Rd, 22304	Performed	2
George Washington	1005 Mt. Vernon Ave, 22301	Performed	2
Minnie Howard	3801 W. Braddock Rd, 22302	Performed	2
Charles Barrett	1115Martha Curtis Dr, 22302	Performed	2
George Mason School	2601 Cameron Mills Rd, 22302	Performed	2
Matthew Maury	600 Russell Rd, 22301	Performed	2
Samuel W. Tucker	435 Ferdinand Day, 22304	Performed	2
William Ramsay	5700 Sanger Ave, 22311	Performed	2
Lyles-Crouch	530 S. Asaph St, 22314	Performed	2
Douglas McArthur	1101 Janney's Lane, 22302	Performed	2

Source: ACPS

Other facility and outdoor maintenance tasks are accomplished by the City of Alexandria through a Facility and Outdoor Maintenance and Use Agreement for Schools and Recreation Centers. The Memorandum of Understanding (MOU) that originally outlined the shared maintenance roles and responsibilities for the two organizations has undergone numerous reviews and updates since its inception in 1997, but the basic principle of creating efficiencies and streamlining work has remained constant. The agreement describes each service to be provided, levels of service expected, and which agency is responsible for maintenance elements required within the delineated spaces. Figure 13 is an example of how the agreement defines the outdoor maintenance service responsibilities at a school.

Figure 13. Example Outdoor Maintenance Service Description



This combination of outsourced and shared services for grounds maintenance has allowed ACPS Educational Facilities to divest itself of in-house grounds maintenance staff, landscaping equipment purchases and maintenance, and other associated resources that would be needed to accomplish the work themselves. Organizations often use an outsourcing delivery model for facility functions that require a relatively low skill level to accomplish and which are of low mission risk if not performed. ACPS has appropriately chosen this approach, and it appears to be efficient. Furthermore, school principals are generally satisfied with the landscaping and grounds maintenance service levels currently provided. Moreover, the August 2016 report of the results of the ACPS 2020 Survey showed that 74 percent of the respondents (community members) agreed that playground and outdoor facilities are accessible and appealing to the community.

Appendix A – Interviews and School Visits

Interviews

The audit team conducted interviews with the following staff members:

- Clarence Stukes, Chief Operating Officer
- Richard Jackson, Educational Facilities Director
- Debra Yap, Assistant Director O&M
- Telly Byrd, Administrative Assistant
- Elijah Gross, Director of Planning, Design & Construction
- David Stallings, Building Systems Manager
- Ruth Clark, Building Services Manager
- James Bartlett, Assistant Director of Health, Safety & Risk
- Michael Gaines, Building Systems Supervisor
- Glods Alberto, Contractor Administration and Building Inspections
- Paul May, Construction Project Engineer
- John Finnegan, Construction Project Engineer
- Thomas Bergeron, Building Engineer
- Erika Gulick, Facilities Planner
- Tracy Armah, Financial Analyst
- Leonard Harris, Plumber
- Karl Moritz, City of Alexandria Planning Director

School Visits

The audit team conducted the following school visits:

- George Mason Elementary School
- Samuel Tucker Elementary School
- George Washington Middle School
- TC Williams High School
- Warehouse