

## CHAPTER 6 – FACILITIES MANAGEMENT

### BACKGROUND

Effective facilities use and management processes consider the educational program needs, type, age, and configuration of owned, leased, and operated facilities. Effective processes enable school districts to plan, finance, and implement changes. A comprehensive program of facilities, custodial, and energy management coordinates all physical resources within a school system. Such a program effectively integrates facilities planning with all other aspects of school planning. Facilities personnel are also involved in design and construction activities and they are knowledgeable about operations and maintenance activities.

To be effective, facilities managers must also be involved in a school system's strategic planning activities. In addition, effective facility departments operate under clearly defined policies, procedures, and activities that can be adapted to accommodate changes in resources and needs.

With 82,863 students during 2013–2014, Metropolitan Nashville Public Schools (the School System) is the 42nd largest school district in the country. The School System maintains 2,000 acres and 200 buildings with more than 14,000,000 square feet of indoor space, including more than 5,000 classrooms. The value of land, buildings, equipment, and improvements total more than \$779,000,000. During 2013–2014, the School System's 157 campuses:

- elementary (grades PK-4) – 73;
- middle (grades 5-8) – 33;
- high (grades 9-12) – 25;
- alternative – 4;
- exceptional education – 4; and
- charter schools – 18.

### CHAPTER HIGHLIGHTS

- A comprehensive facility master plan and a deferred maintenance plan will provide strategic direction for prioritizing and funding future projects.
- The implementation of a comprehensive plan to optimize facility utilization in all clusters will reduce the number of overcrowded and underutilized schools.
- The absence of a staff allocation model contributes to ineffective distribution of workloads and lower productivity.
- Maintenance can further improve efficiency and productivity by moving to a five geographic zone approach to deploy staff to work sites.
- Hiring an in-house energy manager to coordinate energy management programs and continuously evaluate energy use would help to reduce costs.
- By implementing an energy conservation program, the School System can potentially save an estimated \$973,818 annually.
- Estimates from a national facilities management outsource provider suggest that the School System could potentially save an average of \$7,218,977 annually, beginning in 2015-2016, if the department was outsourced.

Schools are geographically organized according to cluster patterns. A “cluster” is a group of elementary and middle schools that “feed” to a single high school in close proximity. The School System has 12 clusters that correspond to each high school; however, some middle schools feed into more than one high school—depending on zoning and transportation issues.

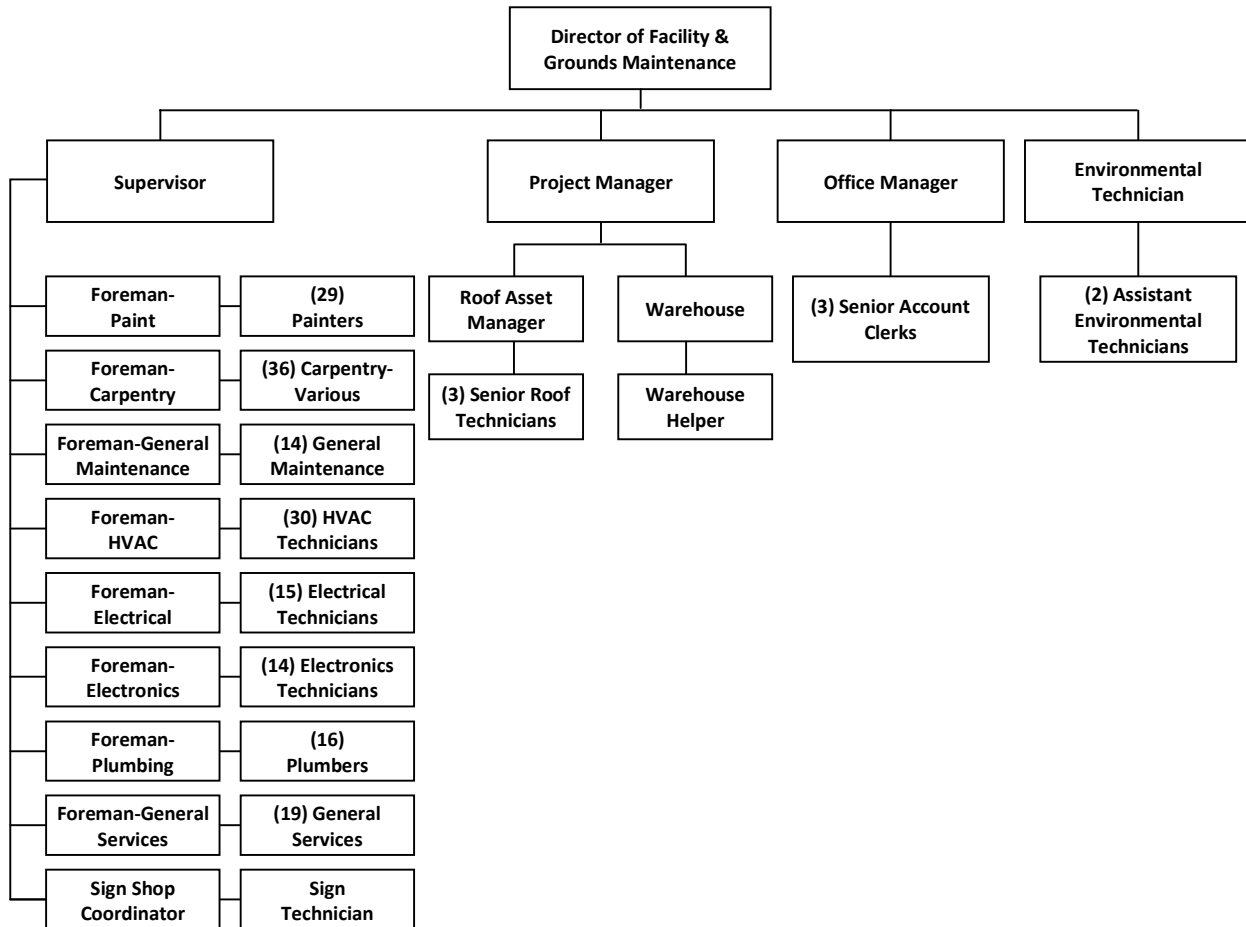
The School System’s Facility & Grounds Maintenance and Facility Planning & Construction Departments are responsible for facilities maintenance and planning, construction, and renovation functions. The Facility & Grounds Maintenance Department consists of 199 employees. Custodial and grounds services (excluding athletic fields) are outsourced. There are five full-time and two part-time employees in the Facility Planning & Construction Department. Facility Planning & Construction has been augmented by a contract project management firm for over 15 years.

The department began using the contractor’s complete construction process in 2011. Through this effort, the School System selected project managers, and the contractor trained them on the project management processes, monitored, and coached their efforts. Project management plans and project master schedules are developed by the department’s project managers and are reviewed by the contractor. The contractor also provides assistance with cost estimates, constructability reviews, specification sections, and technical evaluations. Cost-loaded schedules, and the monthly revisions submitted with pay applications, are reviewed by both the department and contractor. At the conclusion of the project, a project evaluation form should be completed to evaluate the design and construction team and the overall results.

The Student Assignment Services Department serves as a support function for the School System. Student Assignment Services staff help to assure the best use of school building capacity. This is done by reviewing the school attendance boundaries and administering the school choice plan to allow students to attend an optional school.

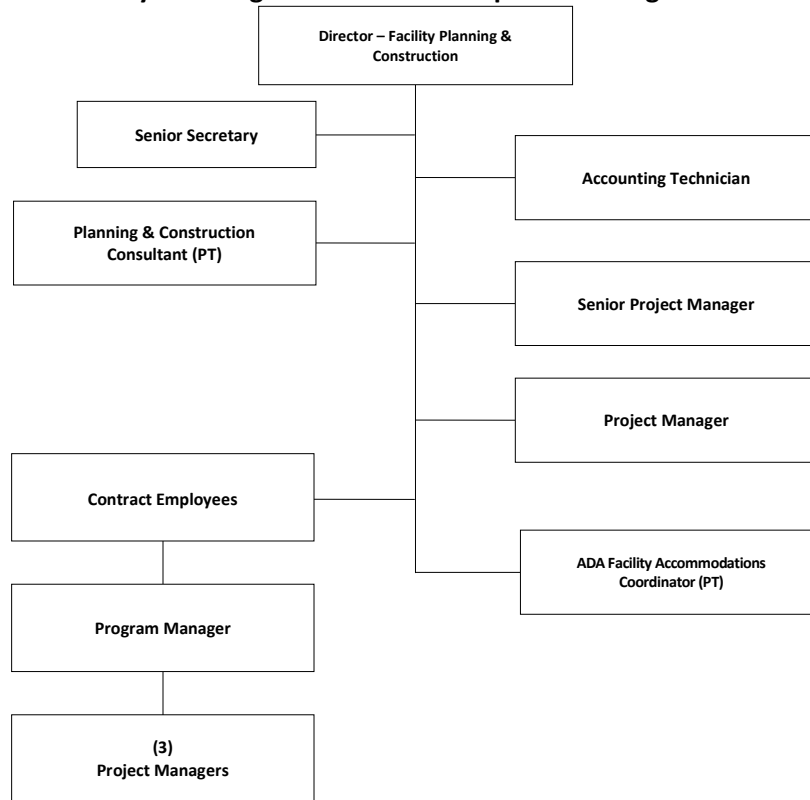
**Exhibits 6-1** and **6-2** represent the department organizations. The directors report to the chief financial officer.

**Exhibit 6-1**  
**Facility & Grounds Maintenance Department Organization**



Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department, February 2014.

**Exhibit 6-2  
Facility Planning & Construction Department Organization**



Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department, February 2014.

Exhibit 6-3 shows the actual operating expenses for the past two years and the current year's budget.

**Exhibit 6-3  
Facility & Grounds Maintenance and Facility Planning & Construction Departments  
Actual Expenses 2011-2012 and 2012-2013 and Budget 2013-2014**

Description	Actual 2011-2012	Actual 2012-2013	Budget 2013-2014
<b>Facilities Maintenance Staff</b>			
Salaries, Support	7,189,167	7,556,490	7,810,400
Supplemental Earnings	601,717	359,425	438,200
FICA, Medicare, Pension & Insurance	3,440,551	3,637,868	3,771,600
Supplies and Materials	3,413,077	3,562,682	3,704,700
Other Expenses	2,008,593	1,570,220	1,426,900
Travel/Mileage	6,554	6,599	2,000
Contracted Services	317,429	185,397	340,400
<b>Subtotal – Facilities Maintenance Staff</b>	<b>\$16,977,088</b>	<b>\$16,878,681</b>	<b>\$17,494,200</b>
<b>Maintenance Supervision</b>			
Salaries, Support	350,809	328,935	136,300
Supplemental Earnings	3,841	1,774	275,100
FICA, Medicare, Pension & Insurance	147,512	137,637	185,500
Supplies and Materials	5,564	5,570	7,500
Travel/Mileage	0	113	2,000
<b>Subtotal – Maintenance Supervision</b>	<b>\$507,726</b>	<b>\$474,029</b>	<b>\$606,400</b>

**Exhibit 6-3  
Facility & Grounds Maintenance and Facility Planning & Construction Departments  
Actual Expenses 2011-2012 and 2012-2013 and Budget 2013-2014 (Cont'd)**

Description	Actual 2011-2012	Actual 2012-2013	Budget 2013-2014
<b>Facility Planning &amp; Construction Staff/Supervision</b>			
Salaries, Support	333,564	348,260	244,600
Supplemental Earnings	0	0	124,100
FICA, Medicare, Pension & Insurance	126,990	139,935	145,100
Supplies and Materials	1,582	3,150	6,400
Other Expenses	676	895	3,600
Travel/Mileage	8,789	6,363	11,600
Contracted Services	2,220	2,443	0
<b>Subtotal – Facility Planning &amp; Construction Staff/Supervision</b>	<b>\$473,821</b>	<b>\$501,046</b>	<b>\$535,400</b>
<b>Grand Total</b>	<b>\$17,958,635</b>	<b>\$17,853,756</b>	<b>\$18,636,000</b>

Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department, February 2014.

Exhibit 6-4 provides a summary of the School System's core academic schools inventory by cluster.

**Exhibit 6-4  
Metropolitan Nashville Public Schools  
Total School Square Footage Inventory by Cluster**

Cluster Name	Average Age	Permanent Square feet	Square Ft of Portables	Gross Square Ft	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization
Antioch Cluster	24	1,058,695	38,000	1,096,695	50	8,193	8,000	102%
Overton Cluster	42	965,185	58,520	1,023,705	77	7,935	7,978	99%
Hillsboro Cluster	60	846,589	12,160	858,749	16	4,904	5,055	97%
Cane Ridge Cluster	22	872,329	29,640	901,969	39	6,197	6,496	95%
McGavock Cluster	44	1,548,022	13,680	1,561,702	18	9,595	10,216	94%
Lottery Schools	52	1,377,605	3,800	1,381,405	5	8,307	8,879	94%
Hunters Lane Cluster	48	1,001,696	23,560	1,025,256	31	6,782	7,412	92%
Hillwood Cluster	43	704,642	9,880	714,522	13	4,993	5,459	91%
Glenclyff Cluster	43	959,169	16,720	975,889	22	5,987	6,628	90%
Pearl-Cohn Cluster	43	805,096	0	805,096	0	3,654	4,336	84%
Maplewood Cluster	40	808,772	760	809,532	1	3,998	5,617	71%
Stratford Cluster	59	840,623	1,520	842,143	2	3,621	5,119	71%
Whites Creek	33	664,263	760	665,023	1	3,070	4,829	64%
<b>Subtotal Core Schools</b>		<b>12,452,686</b>	<b>209,000</b>	<b>12,661,686</b>	<b>275</b>	<b>77,236</b>	<b>86,024</b>	<b>90%</b>
Special Program Schools	33	262,675	6,080	268,755	8	5,942	N/A	N/A
Special Schools	43	431,289	0	431,289	0	876	N/A	N/A
Undesignated	78	21,400	0	21,400	0	0	N/A	N/A
<b>Subtotal Special Schools</b>		<b>715,364</b>	<b>6,080</b>	<b>721,444</b>	<b>8</b>	<b>6,818</b>	<b>N/A</b>	<b>N/A</b>
<b>TOTAL</b>		<b>13,168,050</b>	<b>215,080</b>	<b>13,383,130</b>	<b>283</b>	<b>84,054</b>	<b>N/A</b>	<b>N/A</b>

Source: Student Assignment Services Department and Facility Planning & Construction Department, December 2014.

**Exhibit 6-5** presents a summary of the school and administrative building inventory including leased charter school buildings for which maintenance staff should provide limited major repairs such as a roof leak repair.

**EXHIBIT 6-5  
Metropolitan Nashville Public Schools  
Total Facilities Square Footage Inventory**

Facility	Age	Perm. Bldg. Area (Sq. Ft.)	Present Use
<b>SCHOOLS BUILDINGS</b>		<b>13,168,050</b>	
<b>CLASSROOM PORTABLE BUILDINGS</b>		<b>215,080</b>	
<b>SUBTOTAL SCHOOLS AND PORTABLES</b>		<b>13,383,130</b>	
<b>SUPPORT BUILDINGS</b>			
Bransford Administration Bldg.	72	83,710	Central Office
Martin Professional Development Ctr.	78	44,568	Training
McGruder Family Res. Ctr. (Old J. Early)	74	34,044	
Operations Bldg. (Central Office)	61	46,004	Operations Staff
Print Shop Bldg. (Central Office)	Unknown	6,000	Print Staff
Supply Center	50	55,965	
Transportation	42	44,100	Transportation Staff
Waverly-Belmont IT Center	79	33,776	Technology Staff
Central Alumni Bldg.	64	7,200	
Dalewood (East End Preparatory)	65	108,760	First Floor. Other for Charter School
Hickman (old) Elem. (Spectrum of TN)	57	40,095	
Joelton Middle (was closed for construction)	75	78,647	
Rose Park (was closed for construction)	49	92,905	
Stokes Middle (Lipscomb Univ./FG&M)	78	29,247	
McCann (Nashville Preparatory)	78	21,106	One floor or .5 of 42,211 square feet
Non-classroom portables	Unknown	45,600	
<b>SUBTOTAL BUILDINGS MAINTAINED</b>		<b>14,154,857</b>	
<b>OTHER BUILDINGS NOT MAINTAINED *</b>			
Baxter ALC (Liberty Collegiate Acad.)	104	50,361	Leased to Charter School
Brookmeade (LEAD Academy Middle)	57	49,405	Leased to Charter School
Ewing Park (KIPP Academy)	46	83,830	Leased to Charter School
McCann (Nashville Preparatory)	78	21,105	Leased to Charter School-.5 of 42,211 square feet
Facility & Grounds Maintenance	Leased	44,538	Facilities Staff
<b>GRAND TOTAL BUILDING INVENTORY</b>		<b>14,404,096</b>	

Source: Metropolitan Nashville Public Schools-School Building Inventory List, September 2013, Facility & Grounds Maintenance Department, February 2014.

\*The Facility & Grounds Maintenance Department provides maintenance on a fee for service basis.

**BEST PRACTICES**

Best practices are methods, techniques, or tools that have consistently shown positive results, and can be replicated by other organizations as a standard way of executing work-related activities and processes to create and sustain high-performing organizations. When comparing best practices, similarity of entities or organizations is not as critical as it is with benchmarking. In fact, many best practices transcend organizational characteristics.

McConnell Jones Lanier & Murphy LLP (or the review team) identified 24 best practices against which to evaluate facilities management of the School System. Fourteen out of 24 best practices were met.

**Exhibit 6-6** provides a summary. Best practices that the School System does not meet results in observations, which we discuss in the body of the chapter. However, all observations included in this chapter are not necessarily related to a specific best practice.

**Exhibit 6-6  
Summary of Best Practices – Facilities Management**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
1.	The school system has an effective long-range facilities planning process in place. When developing the annual five-year facilities work plan, the school system evaluates alternatives to minimize the need for new construction and establishes budgetary plans and priorities.		X	Although some components of a facility master plan have been completed, a formal long-range facilities master plan has not been completed. Metropolitan Nashville Public Schools has completed certain planning processes such as the Capital Improvement Budget, enrollment trends and other planning data, yet the system lacks a comprehensive facilities master plan. <b>See Observation 6-A.</b>
2.	The school system has an appropriate organizational structure for the maintenance and operations program and minimizes administrative layers and assures adequate supervision.	X		The department has appropriate layers of management for the number of employees.
3.	The school system has established and implemented accountability mechanisms to ensure the performance, efficiency, and effectiveness of the construction program including post-occupancy evaluations of major construction projects.		X	A post-occupancy evaluation tool has not been developed and implemented. <b>See Observation 6-B.</b>

**Exhibit 6-6  
Summary of Best Practices – Facilities Management (Cont'd)**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
4.	The school system has processes and procedures in place to ensure facilities are efficiently-utilized, based on geographical enrollment patterns.		X	Building inventory includes over and underutilized buildings. The School System has 283 portables in total, of which 275 are assigned to core schools. Maintaining this number of portables may indicate the need for even more aggressive renovation and/or construction of new schools. <b>See Observation 6-C.</b>
5.	The school system uses a staff allocation model to ensure appropriate staffing levels.		X	No staff allocation method is developed and documented. <b>See Observation 6-D.</b>
6.	The school system deploys its maintenance staff resources to geographic locations efficiently and cost effectively.		X	The School System has deployed some of its trade staff by geographic area/zone; however, this operational practice needs to be expanded. Resources generally are not deployed by geographic location. <b>See Observation 6-E.</b>
7.	Accurate and timely demographic projections are performed by the school system to support long-range facilities planning for schools.	X		The School System's Student Assignment Services Department performs this function.
8.	The school system ensures responsiveness to the community through open communication about the construction program and the five-year facilities work plan.	X		Metropolitan Nashville Public Schools has a Capital Improvement Budget, which it uses to communicate progress on large renovation and construction projects. However, there is no construction status on the website.



**Exhibit 6-6**  
**Summary of Best Practices – Facilities Management (Cont’d)**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
9.	The school system has an effective site selection process based on expected growth patterns.	X		A group within Leadership & Learning along with the Student Assignment Services and Facility Planning & Construction Departments establish a need for additional capacity within a region of the School System based on enrollment projections (typically 5 and 10 year targets). Once this group determines the target area, Facility Planning & Construction works with Metropolitan Nashville Government to identify available parcels, and through Metropolitan Nashville Government Legal and Real Estate Departments, to work toward land acquisition. Ultimately, the proposed sale is reviewed by the director of schools and chief financial officer, and then recommended to the Board of Education, prior to seeking approval from Metropolitan Nashville Council.
10.	The school system performs facilities studies to evaluate condition, identify deficiencies and aid in prioritizing deferred maintenance and renovation projects.	X		The School System engages an experienced contractor, MGT of America, through the oversight of the Facility Planning & Construction Department to conduct a comprehensive assessment of facilities condition and provides an objective score for each of its facilities, which is a major component of the planning process.
11.	The school system develops thorough descriptions and educational specifications for each construction project.	X		The School System’s Facility Planning & Construction Department performs this function.
12.	The school system has effective management processes for construction projects.	X		The School System uses a national project management company, Heery International, Inc., during pre-construction and construction phases to assist with project management and oversight.

**Exhibit 6-6  
Summary of Best Practices – Facilities Management (Cont'd)**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
13.	The school system retains appropriate professionals to assist in facility planning, design, and construction.	X		The School System uses a national project management company, Heery International, Inc., to augment internal staff. This practice has proven to be more cost-effective for the School System.
14.	The school system has established and implemented accountability mechanisms to ensure the performance and efficiency of the custodial operations.	X		Custodial operations and non-athletic grounds maintenance are outsourced. Contract requires monthly principal report cards of custodial services and monthly customer satisfaction grounds surveys.
15.	The school system has established and implemented accountability mechanisms to ensure the performance and efficiency of maintenance operations.		X	Standard management reports are not fully utilized although they are available from the SchoolDude automated work order system. <b>See Observation 6-F.</b>
16.	The department has an effective preventative maintenance program in place. The school system uses proactive maintenance practices to reduce maintenance costs.		X	Preventative maintenance program requires improvement. <b>See Observation 6-G.</b>
17.	The department has an effective deferred maintenance program in place.		X	Deferred maintenance projects are documented and potential costs are compiled; however no formal program is in place. <b>See Observation 6-H.</b>
18.	The department maintains educational and district support facilities in a condition that enhances student learning and facilitates employee productivity.	X		The School System's Facility & Grounds Maintenance Department demonstrated evidence that it regularly dispatches maintenance staff to educational and support facilities in an effort to provide appropriate maintenance. The review team toured 32 schools during the onsite visit and found all to be in generally good condition.
19.	The school system provides a staff development program that includes appropriate training for maintenance and operations staff to enhance worker job satisfaction, efficiency, and safety.		X	A comprehensive training plan is needed. <b>See Observation 6-I.</b>

**Exhibit 6-6  
Summary of Best Practices – Facilities Management (Cont'd)**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
20.	The administration has developed an annual budget with spending limits that comply with funding for each category of facilities maintenance and operations.	X		The Facility & Grounds Maintenance Department performs this function in conjunction with the Finance Department.
21.	School system personnel review maintenance and operation's costs and services and evaluate the potential for outside contracting and privatization.	X		Custodial and non-athletic grounds services have been outsourced.
22.	A computerized control and tracking system is used to accurately track work orders.	X		The SchoolDude automated work order system is used to manage work order requests.
23.	The Maintenance & Operations Department has a system for prioritizing maintenance needs uniformly throughout the school system.	X		The SchoolDude automated work order system is used to facilitate prioritizing maintenance needs.
24.	The school system has a comprehensive energy management program in place to conserve energy and contain costs.		X	There is no formal Energy Management program or energy manager. Also, four heating ventilation and air conditioning (HVAC) systems with various levels of automated capabilities are maintained. In addition, the facility services contract indicates that they were hired to develop the energy management program, but this portion of the contract has not been implemented. <b>See Observation 6-J.</b>

Source: McConnell Jones Lanier & Murphy LLP Review Team.

## ACCOMPLISHMENTS

### ACCOMPLISHMENT 6-A

During 2010-2011, the School System saved \$6,522,900 by reducing operating costs because of outsourcing custodial and non-athletic grounds functions and increased projected annual savings to \$8,198,643 by 2012-2013. By outsourcing custodial and grounds keeping operations, the School System saved funds that it can redirect to its educational programs.

The School System issued a Request for Proposals in March 2010, selected a custodial and grounds vendor, and executed a contract with in May 2010 to provide these services. The original base contract was valued at \$22,668,100 per year for five years, and amended to \$23,259,660 per year beginning July 1, 2012. **Exhibit 6-7** presents the School System's projected annual cost savings for 2010-2011 through 2012-2013.

**Exhibit 6-7**  
**Metropolitan Nashville Public Schools**  
**Projected Savings for Outsourced Custodial and Grounds Services**

Description	Estimated Internal Cost versus Actual Costs		
	2010-2011	2011-2012	2012-2013
School System's Internal Estimated Cost of Operations	\$ 29,191,000	\$ 29,191,000	\$ 29,919,429
School System's Estimated Salary, Benefits, Supplies Cost Increase	0	728,429	1,483,669
<b>Total MNPS Estimated Internal Costs*</b>	<b>\$ 29,191,000</b>	<b>\$ 29,919,429</b>	<b>\$ 31,403,098</b>
Cost of contract*	22,668,100	22,712,865	23,204,455
<b>Total Projected Annual Savings</b>	<b>\$ 6,522,900</b>	<b>\$ 7,206,564</b>	<b>\$ 8,198,643</b>

Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department, February 2014.

\*Actual expenditures for 2012-2013 provided by Metropolitan Nashville Public Schools, Budget & Financial Reporting Department, August 2014.

The custodial and grounds maintenance contract requires the vendor to complete a monthly "Report Card" for custodial services to maintain measurable performance standards. Either principals or the building administrator grade the monthly report cards to provide feedback on the quality and responsiveness of the vendor's performance for cleaning hallways, classrooms, cafeterias, restrooms, and other issues raised by building management. The Facility & Grounds Maintenance Department records the feedback for the report cards and trends, which management uses to develop action plans to address any service-level deficiencies noted. Also, principals are required to submit monthly grounds management customer satisfaction surveys to measure the level of satisfaction with services provided by the grounds maintenance vendor.

As shown in **Exhibit 6-8**, 71.8 percent of central administrators, 87.5 percent of principals/assistant principals, and 59.9 percent of teachers, respectively, felt that schools throughout the School System are clean.

**Exhibit 6-8  
Custodial Maintenance Survey Results**

Question	Percentage Responses				
	Number of Survey Respondents	Agree/ Strongly Agree or Somewhat Agree	Disagree or Strongly Disagree	N/A	Total
<b>Schools are clean.</b>					
<b>Survey Group</b>					
Central Administrators	62	71.8%	17.2%	11.0%	100.0%
Principals/Assistant Principals	104	87.5%	12.5%	0.0%	100.0%
Support Staff	438	67.3%	29.5%	3.2%	100.0%
Teachers	1,208	59.9%	39.0%	1.1%	100.0%

Source: McConnell Jones Lanier & Murphy LLP Surveys of Central Administrators, Principals/Assistant Principals, Support Staff, and Teachers, May 2014.

**ACCOMPLISHMENT 6-B**

**The School System has been awarded the U. S. Green Building Council Leadership in Energy & Environmental Design (LEED) Program Silver Certification for eight of its 19 building construction projects that have either been completed or that are underway.**

**Exhibit 6-9** shows the eight construction projects that have received the certification as a result of the efforts of the School System’s Facility Planning & Construction Department. In addition to the certifications that have been awarded, the process is in progress for nine additional construction projects. The School System has participated in Tennessee Efficient Schools Initiative grants valued at \$1,500,000 for energy savings, retrofits, energy audits, and analysis of schools.

**Exhibit 6-9  
Metropolitan Nashville Public Schools Construction Projects Achieving  
Leadership in Energy & Environmental Design Silver Certification**

School	Type	Year
Harpeth Valley Elementary	New Construction	2010
Julia Green Elementary	Addition	2010
Churchwell Elementary	Renovation	2012
Madison Middle	Renovation	2012
Litton Middle	Renovation/Addition	2013
Cane Ridge Elementary	New Construction	2014
Gateway Elementary	Renovation/Addition	2014
Rose Park Middle	Renovation	2014

Source: Metropolitan Nashville Public Schools Facility Planning & Construction Department, December 2014.

The Leadership in Energy & Environmental Design program is an initiative of the U.S. Green Building Council that focuses on encouraging a more sustainable approach to the way buildings are designed, constructed and operated. To attain Silver Certification for new construction and major renovations, the program has five main categories and a project must earn a total of 50 to 59 points. **Exhibit 6-10** presents the evaluation categories and criteria.

**Exhibit 6-10**  
**Leadership in Energy & Environmental Design Program**  
**Silver Certification Evaluation Criteria for Certification**

Evaluation Category	Criteria	Total Possible Points
<b>Sustainable Sites</b>	<ul style="list-style-type: none"> <li>The prerequisite for the Sustainable Sites category aims to curtail pollution and soil erosion that often result from construction.</li> <li>This category also offers points for strategies toward cultivating overall sustainability. For instance, a project wins points for choosing an urban or brownfield site rather than a previously undeveloped area.</li> <li>This category also pertains to the building's direct environmental impact on the immediate area.</li> </ul>	26
<b>Water Efficiency</b>	<ul style="list-style-type: none"> <li>The prerequisite requires for the building to use 20 percent less water than the U.S. Green Building Council baseline for buildings of similar size and occupation.</li> <li>A project garners further points for going substantially beyond this 20 percent reduction in water use, as well as implementing further water conservation measures that pertain to landscaping and wastewater technologies.</li> </ul>	10
<b>Energy and Atmosphere</b>	<ul style="list-style-type: none"> <li>This category focuses mainly on building commissioning and the energy performance of main systems such as heating, ventilating, and air conditioning and lighting.</li> <li>It entails three prerequisites: the building must be fundamentally commissioned (commissioning a building involves the testing and balancing of the main systems to assure optimum performance), use at least 10 percent less energy than the U.S. Green Building Council baseline, and contain systems that do not use any chlorofluorocarbon based refrigerants.</li> <li>Extra points go for progressing further than prerequisite dictates in these areas as well as for the use of renewable energy sources for building operation.</li> </ul>	35
<b>Materials and Resources</b>	<ul style="list-style-type: none"> <li>This category deals with reuse and recycling of materials, both in the construction and the ongoing operation of the building.</li> </ul>	14
<b>Indoor Environmental Quality</b>	<ul style="list-style-type: none"> <li>This category deals mainly with indoor air quality issues including ventilation and off-gassing of materials and thermal comfort.</li> <li>This category also deals with the need for lighting systems to be energy efficient as well as adequate for all necessary tasks.</li> </ul>	15
<b>Total Points</b>		<b>100</b>

Source: Requirements for Leadership in Energy & Environmental Design Silver Certification, eHow website, [http://www.ehow.com/list\\_7320789\\_requirements-lead-silver-certification.html](http://www.ehow.com/list_7320789_requirements-lead-silver-certification.html)

Given the rigorous evaluation criteria construction and renovation projects must meet to achieve Leadership in Energy & Environmental Design Silver Certifications, the School System's Facility Planning & Construction Department is demonstrating a strong commitment to strengthening energy management practices by applying for and earning these awards.

**ACCOMPLISHMENT 6-C**

In October 2011, the School System's Facility & Grounds Maintenance Department in conjunction with the Metropolitan Nashville Government Health Department completed radon testing in all Metropolitan Nashville Public Schools' buildings. Eighty out of the 139 School System buildings (excludes charter schools) at that time had elevated radon levels in one or more rooms.

Remediation work was completed and tests showed radon levels in these buildings were all within acceptable levels within the time period required by Metropolitan Nashville Government Ordinance, October 27, 2013. The work involved testing more than 8,000 rooms and providing radon mitigation activities at an approximate cost of \$108,164.

## DETAILED OBSERVATIONS

### PLANNING

#### OBSERVATION 6-A

**The School System has completed components of a facilities master plan; however, a formal, comprehensive long-range facilities master plan has not been developed.**

A facilities master plan is critical to the overall success of a school system’s operations. A master plan assesses needs and facility deficiencies, and coordinates educational programs with the availability of physical space and resources. It also establishes a formal, written vision and road map for future facilities plans into one comprehensive document.

In the absence of a formal facilities master plan, the School System uses its Capital Improvement Budget process to serve as its primary facilities planning tool. Major responsibility for preparing the capital budget is shared by the School System’s chief financial officer (primary coordinator of the effort), the Student Assignment Services Department and the Facility Planning & Construction Department. Other School System departments that provide critical input to the capital budget process are listed in **Exhibit 6-11**.

**Exhibit 6-11  
Metropolitan Nashville Public Schools  
Departmental Contributors to Capital Budget Process**

Department	Input
Facility & Grounds Maintenance	Specific building and districtwide deferred maintenance.
Leadership & Learning	Educational programs that impact space and furnishings.
Technology	Districtwide technology needs.
Transportation	School buses and fleet vehicles.
Nutrition Services	Specific school space and equipment needs.
Security	Cameras, alarm systems, locks, communication equipment, and security vehicles.
Athletics	Specific needs for all sports programs.
American Disabilities Act Compliance	Building modifications and fixture or equipment needs to respond to requests for accommodation.

*Source: Metropolitan Nashville Public Schools, Facility Planning & Construction Department, February 2014.*

The Student Assignment Services Department evaluates and projects facility capacity needed at each school and in each cluster of the School System—analyzing critical factors such as demographic trends, current and projected enrollment, program capacity of existing schools, and use of portable buildings. Additional capacity needs at existing schools are identified, along with the number of additional classrooms or other educational space requirements. Depending on the availability of land at existing schools, overcrowding at an existing school may be relieved by adding seat capacity to a nearby school through rezoning attendance boundaries. Additionally, the Student Assignment Services Department identifies geographic areas within the School System that require new school construction and participates in the selection of potential school sites. Capital requests are generated to address additional seat capacity requirements.



The Facility Planning & Construction Department is responsible for ensuring that the School System’s facilities function in a safe, healthy environment for students and staff. The two most critical responsibilities of the Facility Planning & Construction Department are the long-range planning and standardization of design and materials and ongoing comprehensive assessment of facilities condition.

The School System engages a contractor, through the oversight of the Facility Planning & Construction Department to conduct a comprehensive assessment of facilities condition. Through the facilities condition assessment, each facility is assigned an objective score that helps to determine budget requirements so necessary renovations can be planned and executed that meet or exceed the School System’s standards. The Facility Planning & Construction Department also oversees an additional major contractor, Heery International, Inc., that provides consultant services in construction project management and establishing facilities design standards.

The School System ultimately uses all of these data points to assist with the preparation of a detailed, six-year Capital Improvement Budget along with high-level capital budgets for four additional years. The capital budget is made up of a six-year list of projects, approved annually by the School System’s Board of Education. The School System’s 2014-2020 Capital Improvement Budget summary is presented in **Exhibit 6-12**.

**Exhibit 6-12**  
**Summary Total of 2014-2020 Capital Improvement Budget**

Budget Period	School Specific Projects	Districtwide Projects	Grand Total
2014-2015	\$187,760,000	\$61,595,500	\$249,355,500
2015-2016	144,575,000	48,845,500	193,420,500
2016-2017	145,285,000	44,293,500	189,578,500
2017-2018	108,850,000	46,081,000	154,931,000
2018-2019	76,950,000	33,332,500	110,282,500
2019-2020	53,625,000	39,049,000	92,674,000
<b>Cost of Six-Year Program</b>	<b>717,045,000</b>	<b>273,197,000</b>	<b>990,242,000</b>
Beyond 6 Years 2020-2024	57,364,000	120,947,000	178,311,000
<b>Grand Total: Cost of Ten-Year Program</b>	<b>\$774,409,000</b>	<b>\$394,144,000</b>	<b>\$1,168,553,000</b>

*Source: Metropolitan Nashville Public Schools, Facility Planning & Construction Department, February 2014.*

The average age of the School System’s facilities is 43 years. The most significant challenge to adequately support facilities is consistent capital funding. The School System’s capital budget process alone does not provide the scope of long-range strategic planning required for ongoing facilities improvements. **Exhibit 6-13** provides a summary of the major processes performed and deliverables typically found in a long-range facility plan and the progress the School System has made toward completing those components.

**Exhibit 6-13**  
**Model Facilities Planning Process Deliverables and**  
**Metropolitan Nashville Public Schools Planning Process Components**

Deliverables	Components Included in MNPS Planning Process
School and administrative facilities deficiencies and inefficiencies, including modernization, functionality, and spatial requirements at older schools and the School System’s administrative facilities.	The School System’s process addresses deficiencies, inefficiencies and spatial requirements of each building through the facility assessments, utilizing the MGT BASYS system (software name). This process evaluates conditions and educational suitability of each facility.
Functional equity, preservation, and upgrades to quality schools and administrative facilities.	Through the Balanced Automated Systems evaluation and report, a score for each facility is developed and priorities established.
Quality and worthiness of continued preservation of existing schools and administrative facilities.	The Student Assignment Services Department provides input regarding projected capacity and determines the need for additional facility space. The Facility Planning & Construction Department along with project specific architects, determine if the school can be renovated and upgraded, or if it should be demolished and rebuilt at the same site.
Optimal facility utilization within school clusters and individual schools.	The School System has published a utilization scale used for the capital budget planning process. The scale has five categories referenced in the map “Metropolitan Schools’ Capacities and Future Growth”. The map uses a color scheme aligned with the utilization scale to identify geographic areas most overcrowded and underutilized. This same scale was used for the Board Resolution on Charter schools to consider new charter schools in areas that are projected to have a utilization rate of 120% or higher.
Strategies to minimize portables for classroom and administrative use.	<p>The 10-year Capital Improvement Budget identifies and requests funding for school additions and new facilities to eliminate or reduce the number of portables.</p> <p>While student enrollment has consistently increased over the past eight years, growing by 10,408 students, the School System aggressively seeks capital funding to keep pace with enrollment growth. The School System has added 477 additional classrooms which has increased school capacity by 9,434 students/seats. There are six additional construction projects that will add 112 classrooms and will increase student capacity by 2,100 students/seats.</p>

**Exhibit 6-13**  
**Model Facilities Planning Process Deliverables and**  
**Metropolitan Nashville Public Schools Planning Process Components (Cont'd)**

Deliverables	Components Included in MNPS Planning Process
Strategies to minimize portables for classroom and administrative use. (Cont'd)	The School System has a comprehensive School Choice process that allows parents to pick a school that best fits the academic needs for their child. One out of four students in the School System is enrolled in an out-of- zone school. One of the many benefits of the School Choice process is improved facility utilization. There are 85 schools offered in the choice process; many of which would be significantly underutilized if their enrollment was limited to school zones. If students were required to attend their zoned school; this would increase overcrowding in the Antioch Cluster to 135% of capacity.
Strategies for addressing changing requirements of student population shifts resulting from growth and decline in neighborhoods and charter school expansion.	<p>The Student Assignment Services Department maintains both long and short-range projections, which are used to plan for population changes. In addition to the projections created by departmental staff, private software products are used to complement other School System reports such as ESRI Community Analyst.</p> <p>The School System performs various detailed studies of charter school enrollments which help to study the impact on other schools.</p> <p>School System staff has a close working relationship with the Metropolitan Nashville Planning Commission which provides collaboration on long range plans.</p>
Standards and criteria to develop the scope of facility improvements.	School System Educational Specifications, Space Standards, and Design Guidelines establish scope and requirements of facility improvements.
Lowering costs associated with small, functionally deficient schools.	Energy and maintenance costs are reduced when the facility is renovated through the Capital Budget.
Exploration of joint-use opportunities with public and private partnerships related to facilities.	The Student Assignment Services Department explores options to lease buildings and co-locate charter schools.
Administrative costs associated with implementing the plan and related benefits.	This planning component is not included in current process.
Strategies to maximize potential reductions in operation costs.	The Planning & Construction Department works closely with the Facility & Grounds Maintenance Department on building assessments to address energy and maintenance costs reductions. These annual adjustments to building assessments are developed through working sessions and are not captured as a final document.
Identification of current and future needs of district facilities and education programs.	Future facility and space needs are captured through existing process. Future educational programs and resulting facility needs are not captured.

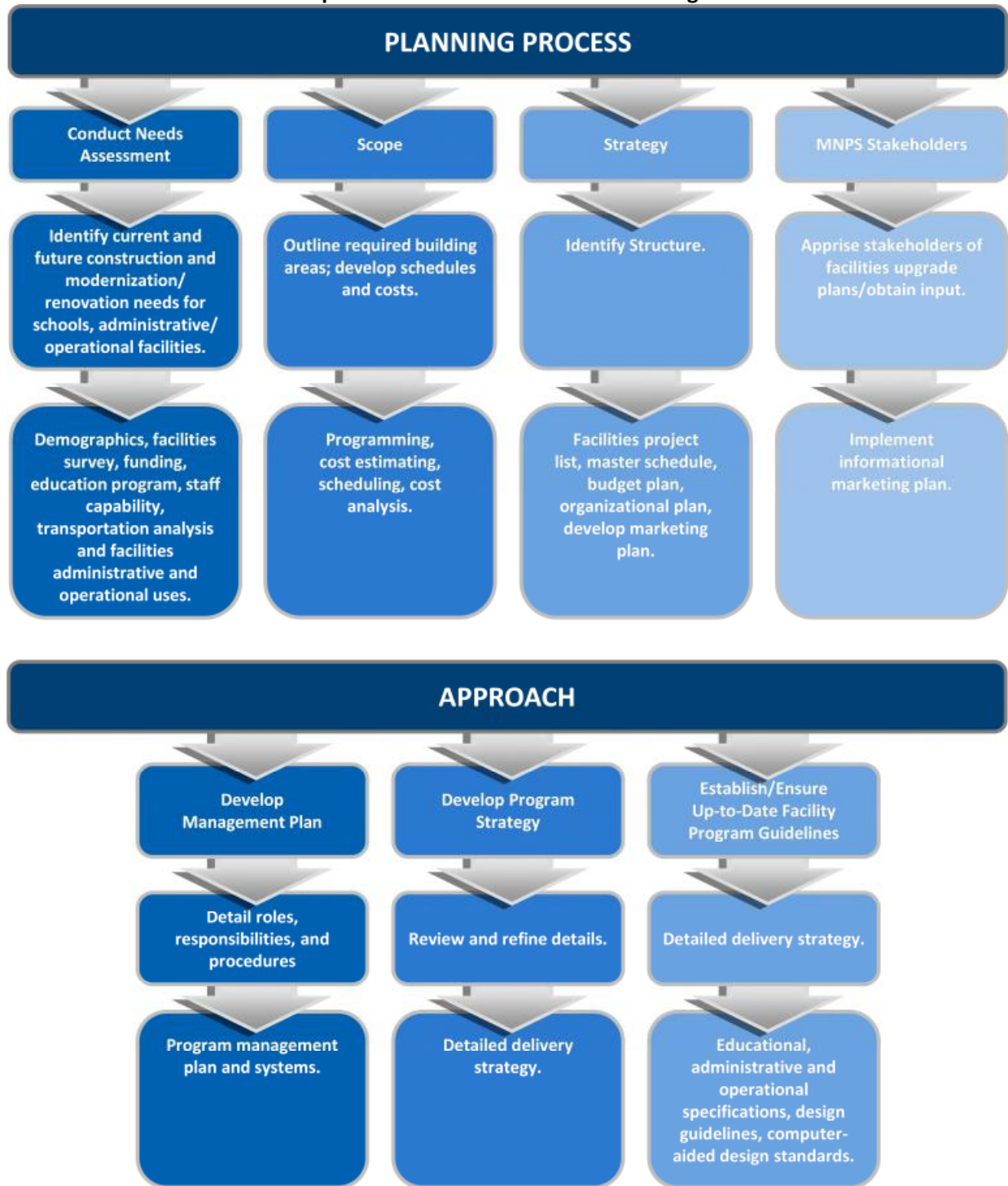
**Exhibit 6-13  
Model Facilities Planning Process Deliverables and  
Metropolitan Nashville Public Schools Planning Process Components (Cont'd)**

Deliverables	Components Included in MNPS Planning Process
Development of measurable objectives and goals.	This planning component is not included in current process.
Community input into the planning and decision-making process.	Improved communication processes are being developed jointly with the School System Board of Education, Metropolitan Nashville Council, and other Metropolitan Nashville Government departments, along with school and community participants. These are currently project specific. Systemwide communications, however, are not included.
Criteria for optimum school sizes to reduce operating costs.	This planning component is not included in current process.
Criteria for determining which facilities are obsolete and are too costly to upgrade.	This process is considered when developing the Capital Improvement Budget. Consideration includes the need for current location, community involvement within a school, and historical value of facility.
Application of programming, design, and operating criteria to assess the need and priorities for preserving and upgrading existing facilities.	Programming and design needs are considered through the Educational Specification, Space Standards, and Design Guidelines.
Provide analyses of the long-term operating costs of equipment, maintenance, and energy compared to the quality of the facility.	This planning component is not included in current process.
Comprehensive facility plan document that summarizes many of the major planning processes and includes implementation strategies and timelines.	This planning component is not included in current process.

*Source: Metropolitan Nashville Public Schools, Facility Planning & Construction Department, December 2014.*

A sample facilities planning process model is shown in **Exhibit 6-14**. This model is often used to assist school districts in developing a facilities master plan.

**Exhibit 6-14**  
**Sample Facilities Master Plan Process Diagram**



Source: The Texas Education Agency.

Exhibit 6-15 presents a model that is used to convert goals and objectives included in a comprehensive facilities master plan into measurable benchmarks.

**Exhibit 6-15  
Master Plan Goals & Objectives Expressed as Measurable Benchmarks**

Area	Benchmark	Current Measure
<b>Facility Use</b>	Percent of utilization of permanent space – Cluster	%
	Percent utilization of permanent space – High	%
	Percent utilization of permanent space – Middle	%
	Percent utilization of permanent space – Elementary	%
	Percent Schools with utilization less than 85 percent – Cluster	%
	Amount/Percent Underutilized Space Converted to Useable Space	SFT / %
<b>Planning</b>	Portable space as a percentage of classroom space – Cluster	%
	Portable space as a percentage of classroom space – High	%
	Portable space as a percentage of classroom space – Middle	%
	Portable space as a percentage of classroom space – Elementary	%
	Gross Sq. Ft./Student – Cluster	SFT
	Gross Sq. Ft./Student – High	SFT
	Gross Sq. Ft./Student – Middle	SFT
	Gross Sq. Ft./Student – Elementary	SFT
	Deferred Maintenance Backlog – Cluster	\$
	Percent of Schools with Deficient Media Resource Centers & Cafeterias – Cluster (Elementary, Middle, and High School)	\$
<b>Accessibility &amp; Safety</b>	Air Quality Levels	Readings
	Number and percent of Schools with Full Accessibility for Special Needs – Cluster (Elementary, Middle and High Schools)	Number/ %
<b>Delivery &amp; Funding</b>	Design Services Costs as a Percentage of Construction Costs	%
	FF&E (including finance costs, if any) Costs/Student Served	\$
	Program Master Schedule/Duration	Months
	Program Investment Cost/Student	\$
<b>Operations</b>	Facility Planning & Operations Cost/Sq. Ft.	\$
	Facility Planning & Operations Cost/Student	\$
	Energy Cost/Sq. Ft.	\$
	Custodial Operations Cost/Sq. Ft. (Outsourced)	\$
	Project Construction Costs/Student	\$
	Preventive Maintenance Program Budget	\$

Source: McConnell Jones Lanier & Murphy LLP.

**RECOMMENDATION 6-A.1:**

**Complete the planning components necessary to implement a fully-integrated 10-year Facilities Master Plan that addresses systemwide needs.**

The School System should retain the services of a consultant with experience in conducting facilities master plans for similar-sized school districts. The master plan should integrate data already gathered by

the School System, as well as develop strategic initiatives that enhance facilities and improve the learning environment for students.

### **FISCAL IMPACT**

The facilities master plan can be developed at a one-time cost to the School System of \$200,000. The estimate assumes a team of consultants will augment the Facility Planning & Construction Department's input along with the Student Assignment Services Department and the School System's chief financial officer in the development of the plan.

### **OBSERVATION 6-B**

#### **The Facility Planning & Construction Department has not implemented a post-occupancy evaluation tool to conduct assessments of new construction and renovation projects.**

The department is in the process of developing a post-occupancy evaluation tool and anticipate that formal procedures for conducting assessments of new construction and renovation projects would be in place in August 2014, when new and renovated campuses open at the start of the school year. The School System contracts with Heery International, Inc., for construction project management services. According to Facility Planning & Construction Department management, Heery International, Inc., developed post-occupancy reports for other school district construction programs and has provided a template for the School System's use.

Post-occupancy evaluations are a necessary part of ongoing improvements and cost-effective management techniques. Failure to document performance deficiencies identified in the post-construction evaluation; the reasons for their occurrence; and procedures for avoiding the deficiency in the future, can result in continuous oversights and errors recurring in future projects. Potential problems can be greatly reduced by instituting post-occupancy evaluations following buildings' completion and occupancy.

Valuable lessons can be learned from post-occupancy evaluations. Design quality will be improved, and costs can be reduced. Most post-construction evaluations include highly structured and well-documented reviews, providing at a minimum, the answers to the following questions:

- How well the completed building conforms to the educational program?
- Did the educational program produce the desired results?
- Does the facility meet expectations of building code officials and school administrators concerned with security, safety, and risk management?
- Do the HVAC equipment, toilet accessories, and furniture and equipment fit within the guidelines for repair and replacement?
- How well does the facility provide access to persons with special needs?
- Is the facility neighborhood-friendly?
- How well do the materials used in construction meet expected long-term maintenance and repair concerns?

- What impact do construction materials have on custodial operations?
- How do energy operating costs, comfort ventilation, and health and sanitation impact the overall quality of facilities?

#### **RECOMMENDATION 6-B.1**

##### **Develop and implement a process to conduct post-occupancy evaluations of major construction projects.**

The Facility Planning & Construction Department should include the school principal, educational program directors, teachers, maintenance and custodial staff, food service staff, and any selected facilities support staff deemed appropriate in the evaluation.

The data gathered should be incorporated into the School System's facility design standards.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

### **SCHOOL UTILIZATION**

#### **OBSERVATION 6-C**

##### **The School System lacks a comprehensive plan that ensures facility utilization is optimized.**

The overall school cluster utilization rate ranges from 102 percent to 64 percent, resulting in overcrowded and underutilized schools. Plans have been developed to address overcrowding in some, but not all clusters or, in clusters where schools are underutilized. School system management indicated that more aggressive plans to relieve overcrowded and underutilized school conditions are limited because of the lack of control of receiving funding from the Metropolitan Nashville Government.

The School System's Student Assignment Services Department has the responsibility for monitoring enrollment growth and decline, and overall facility utilization. The School System uses its student assignment policies, including the 2008 rezoning plan and School Board Operations 1.105, as well as strategies outlined in the United States Department of Education's Guidance on the Voluntary Use of Race to Achieve Diversity and Avoid Racial Isolation in Elementary and Secondary Schools. A Diversity Management Plan has been developed, and is used to consider any foreseeable impact to student diversity—prior to making recommendations regarding student assignment that will impact utilization rates.

Overcrowding and underutilization of facilities is a challenge that many school systems face—particularly those in urban areas, due to ongoing changes in student demographic trends, housing patterns, and mobility rates.

There are no consistent documented standards for determining ranges for effective school facility utilization by use category. This is important because overcrowded schools negatively impact students'



learning environments and underutilized schools are far more costly to operate on a per student basis. For purposes of this analysis, the review team analyzed existing school facility data such as building square footage, number of portables, three-year enrollment trends, and utilization rates based on October 2013 enrollment, and the two prior school years. From the analysis, the review team established sample use rate categories to assess the School System’s facility utilization effectiveness by cluster and individual school. Definitions for the sample use rate categories include the following:

- Overcrowded – utilization rate of 111 percent or higher;
- Targeted utilization – utilization rate of 80 to 110 percent (ideal use rate 85 to 95 percent);
- Underutilization and candidate for co-location of programs – utilization rate of 55 to 79 percent; and
- Underutilization and candidate for consolidation or closure – utilization rate of 54 percent and below for two consecutive years.

**Exhibit 6-16** shows the utilization rates for each school cluster and the lottery (magnet) schools based on October 2013 enrollment. The exhibit illustrates the dramatic differences in utilization rates among the clusters. The Antioch cluster has the highest utilization rate at 102 percent and the Whites Creek cluster has the lowest utilization rate at 64 percent. The exhibit also illustrates that even with the wide disparity of utilization rates among the clusters, no individual cluster, has schools that are completely overcrowded or severely underutilized.

**Exhibit 6-16  
Metropolitan Nashville Public Schools Facility Cluster Summary and Utilization Rate**

Cluster Name	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Antioch Cluster	24	1,058,695	38,000	1,096,695	50	8,193	8,000	102%
Overton Cluster	42	965,185	58,520	1,023,705	77	7,935	7,978	99%
Hillsboro Cluster	60	846,589	12,160	858,749	16	4,904	5,055	97%
Cane Ridge Cluster	22	872,329	29,640	901,969	39	6,197	6,496	95%
McGavock Cluster	44	1,548,022	13,680	1,561,702	18	9,595	10,216	94%
Lottery Schools	52	1,377,605	3,800	1,381,405	5	8,307	8,879	94%
Hunters Lane Cluster	48	1,001,696	23,560	1,025,256	31	6,782	7,412	92%
Hillwood Cluster	43	704,642	9,880	714,522	13	4,993	5,459	91%
Glencliff Cluster	43	959,169	16,720	975,889	22	5,987	6,628	90%
Pearl-Cohn Cluster	43	805,096	0	805,096	0	3,654	4,336	84%
Maplewood Cluster	40	808,772	760	809,532	1	3,998	5,617	71%
Stratford Cluster	59	840,623	1,520	842,143	2	3,621	5,119	71%
Whites Creek Cluster	33	664,263	760	665,023	1	3,070	4,829	64%
<b>Subtotal Core Schools</b>	<b>43</b>	<b>12,452,686</b>	<b>209,000</b>	<b>12,661,686</b>	<b>275</b>	<b>77,236</b>	<b>86,024</b>	<b>90%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

Of the School System’s 12 clusters, eight—Antioch, Overton, Hillsboro, McGavock, Hillwood, Glencliff, Hunters Lane, and Stratford—have a combined total of 14 individual schools with utilization rates of 111 percent or higher. All but two of these schools are scheduled on the School System’s capital budget to receive additions, renovation, or replacement. Five of these projects are scheduled in 2014-2015; one project is scheduled in 2015-2016; three projects are scheduled in 2016-2017; and two projects are scheduled in 2017-2018.

As noted earlier, the Antioch cluster has the highest utilization rate in the School System at 102 percent. Within the Antioch cluster, Lakeview Design Center and Thomas A. Edison Elementary have utilization rates at 135 percent and 113 percent, respectively. J.E. Moss Elementary School is approaching overcrowded status with a utilization rate of 110 percent. All of the remaining schools in the Antioch cluster have a utilization rate in the targeted range of 80 percent to 110 percent. Additionally, the Antioch cluster is operating with 50 portables, the second highest number of portables within the 12 clusters. Portables are used to provide additional classroom and administrative space. The high number of portables further accentuates the overcrowded conditions in the Antioch cluster (**Exhibit 6-17**).

**Exhibit 6-17  
Antioch Facility Cluster Summary and Utilization Rate**

Antioch Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Lakeview Design Center	47	83,429	12,920	96,349	17	929	689	135%
Thomas A. Edison Elementary School	10	70,775	4,560	75,335	6	689	608	113%
J E Moss Elementary School	26	101,313	3,800	105,113	5	910	827	110%
Una Elementary School	27	93,703	9,880	103,583	13	899	850	106%
J. F. Kennedy Middle School	13	114,620	0	114,620	0	839	834	101%
Antioch Comprehensive High School	17	287,393	6,840	294,233	9	1,971	1,982	99%
Mt. View Elementary	15	86,180	0	86,180	0	670	732	92%
Apollo Middle School	47	142,702	0	142,702	0	812	918	88%
Margaret Allen Middle School	12	78,580	0	78,580	0	474	560	85%
<b>Cluster Total/Average</b>	<b>24</b>	<b>1,058,695</b>	<b>38,000</b>	<b>1,096,695</b>	<b>50</b>	<b>8,193</b>	<b>8,000</b>	<b>102%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014. Note: A new elementary school with capacity for 800 students will open in 2015-2016 to relieve overcrowding at Lakeview Design Center and Thomas A. Edison Elementary School.

The Overton cluster has a utilization rate of 99 percent, the second highest in the School System. Within this cluster, both Tusculum Elementary School—with a utilization rate of 120 percent, and Crieve Hall Elementary School, with a utilization rate of 113 percent, would be considered overcrowded under the review team’s sample utilization categories. Haywood Elementary School is approaching overcrowded status with a utilization rate of 109 percent.

All 10 schools in the Overton cluster are operating at a targeted utilization rate of 80 percent or higher; however, it is important to note that the Overton cluster operates with the highest number of portables at 77—which are used for classroom and administrative use, accentuating the overcrowded conditions at some of its schools (**Exhibit 6-18**).

**Exhibit 6-18  
Overton Facility Cluster Summary and Utilization Rate**

Overton Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Tusculum Elementary School	62	60,554	7,600	68,154	10	640	534	120%
Crieve Hall Elementary School	60	57,418	1,520	58,938	2	401	356	113%
Haywood Elementary School	55	87,009	9,880	96,889	13	874	803	109%
John Overton Comprehensive High School	56	248,441	3,800	252,241	5	1,795	1,703	105%
Norman Binkley Elementary School	54	44,923	15,200	60,123	20	780	789	99%
Croft Middle Design Center	11	110,000	0	110,000	0	736	761	97%
McMurray Middle School	50	123,150	0	123,150	0	729	788	93%
Granbery Elementary School	50	73,573	7,600	81,173	10	726	794	91%
William Henry Oliver Middle School	10	89,392	5,320	94,712	7	787	900	87%
Shayne Elementary School	10	70,725	7,600	78,325	10	467	550	85%
<b>Cluster Total/Average</b>	<b>42</b>	<b>965,185</b>	<b>58,520</b>	<b>1,023,705</b>	<b>77</b>	<b>7,935</b>	<b>7,978</b>	<b>99%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-19** shows the Hillsboro cluster with a 97 percent utilization rate overall. In the Hillsboro cluster, Julia Green Elementary and Percy Priest Elementary Schools have the highest utilization rates in the cluster, 117 percent and 112 percent, respectively. All schools in the cluster are at the review team's targeted utilization rate of 80 percent or higher.

**Exhibit 6-19  
Hillsboro Facility Cluster Summary and Utilization Rate**

Hillsboro Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Julia Green Elementary School	66	67,005	5,320	72,325	7	580	495	117%
Percy Priest Elementary School	58	59,418	2,280	61,698	3	555	494	112%
Eakin Elementary School	86	103,730	0	103,730	0	578	575	101%
J T Moore Middle School	45	109,083	760	109,843	1	646	661	98%
West End Middle School	75	99,514	1,520	101,034	2	472	505	93%
Carter-Lawrence Magnet Elementary School	10	65,458	0	65,458	0	390	434	90%
Sylvan Park Paideia Design Center	79	69,221	760	69,981	1	474	532	89%
Hillsboro Comprehensive High School	59	273,160	1,520	274,680	2	1,209	1,359	89%
<b>Cluster Total/Average</b>	<b>60</b>	<b>846,589</b>	<b>12,160</b>	<b>858,749</b>	<b>16</b>	<b>4,904</b>	<b>5,055</b>	<b>97%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014. Note: Waverly Belmont Elementary School will open in 2015-2016 to relieve overcrowding at Julia Green Elementary School and Percy Priest Elementary School.

**Exhibit 6-20** shows that the Cane Ridge cluster has a 95 percent utilization rate. All schools in the cluster are at the review team's targeted utilization rate of 80 percent or higher.

**Exhibit 6-20**
**Cane Ridge Facility Cluster Summary and Utilization Rate**

Cane Ridge Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Cane Ridge Elementary School	2	90,684	3,040	93,724	4	902	830	109%
Cole Elementary School	52	83,830	1,520	85,350	2	816	789	103%
Cane Ridge Comprehensive High School	6	310,000	0	310,000	0	1,669	1,669	100%
Marshall Middle School	8	113,519	0	113,519	0	810	890	91%
Antioch Middle School	65	132,476	10,640	143,116	14	693	780	89%
A.Z. Kelley Elementary School	8	77,480	3,800	81,280	5	723	825	88%
Henry Maxwell Elementary School	13	64,340	10,640	74,980	14	584	713	82%
<b>Cluster Total/Average</b>	<b>22</b>	<b>872,329</b>	<b>29,640</b>	<b>901,969</b>	<b>39</b>	<b>6,197</b>	<b>6,496</b>	<b>95%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-21** shows that the McGavock cluster maintains a utilization rate of 94 percent. Ruby Major Elementary, Dupont Tyler Middle, and Pennington Elementary schools are all overcrowded, based on the review team's sample target utilization of 111 percent or higher. The remaining schools in the cluster are in the targeted utilization range of 80 percent to 110 percent, with the exception of Tulip Grove Elementary School, which has a utilization rate of 74 percent.

**Exhibit 6-21**
**McGavock Facility Cluster Summary and Utilization Rate**

McGavock Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Ruby Major Elementary	9	68,600	2,280	70,880	3	649	575	113%
Dupont Tyler Middle School	45	123,903	760	124,663	1	658	591	111%
Pennington Elementary School	55	42,488	3,800	46,288	5	366	330	111%
McGavock Elementary School	59	42,030	3,040	45,070	4	311	294	106%
Hickman Elementary School	14	71,466	2,280	73,746	3	552	532	104%
Dodson Elementary School	46	65,634	1,520	67,154	2	545	551	99%
Dupont Hadley Middle School	75	106,348	0	106,348	0	638	661	97%
Dupont Elementary School	63	60,372	0	60,372	0	461	489	94%
Napier Enhanced Option School	14	75,145	0	75,145	0	458	499	92%
Andrew Jackson Elementary School	45	74,290	0	74,290	0	535	584	92%
McGavock Comprehensive High School	43	456,100	0	456,100	0	2299	2531	91%
Donelson Middle School	61	112,489	0	112,489	0	674	761	89%
Two Rivers Middle School	54	113,651	0	113,651	0	597	702	85%
Hermitage Elementary School	52	53,954	0	53,954	0	298	370	81%
Tulip Grove Elementary School	25	81,552	0	81,552	0	554	746	74%
<b>Cluster Total/Average</b>	<b>44</b>	<b>1,548,022</b>	<b>13,680</b>	<b>1,561,702</b>	<b>18</b>	<b>9,595</b>	<b>10,216</b>	<b>94%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-22** shows that the utilization rate for lottery (magnet) schools is 94 percent. All of the schools within this cluster fall within the review team's sample target utilization of 80 percent or higher, with the exception of Haynes Middle Health/Medical Science Design Center, which has a utilization rate of 38 percent.

**Exhibit 6-22  
Lottery Schools Facility Cluster Summary and Utilization Rate**

Lottery Schools Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Head Magnet Middle School	62	65,873	0	65,873	0	597	547	109%
Meigs Magnet Middle School	10	84,885	1,520	86,405	2	693	666	104%
Hume-Fogg Magnet High School	102	207,322	0	207,322	0	922	892	103%
Martin Luther King, Jr. Magnet at Pearl High School	78	141,034	0	141,034	0	1,195	1,162	103%
Glendale Elementary School	61	54,746	760	55,506	1	423	413	102%
Stanford Montessori Elementary School	12	54,470	0	54,470	0	420	413	102%
Lockeland Design Center	75	40,183	760	40,943	1	294	299	98%
East Nashville Magnet School	82	208,308	0	208,308	0	1,196	1,216	98%
Hull-Jackson Montessori Magnet Elementary School	17	78,100	0	78,100	0	477	489	98%
Jones Paideia Magnet School	78	64,560	0	64,560	0	374	418	89%
Rose Park Middle Math/Science Magnet	60	45,962	0	45,962	0	407	459	89%
Nashville School of the Arts Magnet High School	31	140,665	0	140,665	0	640	772	83%
I.T. Creswell Arts Middle Magnet School	53	110,405	0	110,405	0	459	573	80%
Haynes Middle Health/Medical Science Design Center	11	81,092	760	81,852	1	210	560	38%
<b>Cluster Total/Average</b>	<b>52</b>	<b>1,377,605</b>	<b>3,800</b>	<b>1,381,405</b>	<b>5</b>	<b>8,307</b>	<b>8,879</b>	<b>94%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-23** shows the Hillwood cluster has a utilization rate of 91 percent. Hillwood Comprehensive High School has the lowest utilization rate, at 69 percent, of all schools in the cluster, and is considered to be underutilized based on the review team’s sample use categories. Bellevue Middle School is categorized as overcrowded, and Westmeade Elementary School is approaching overcrowded status with utilization rates of 114 percent and 110 percent, respectively. All remaining schools are in the target range for utilization.

**Exhibit 6-23  
Hillwood Facility Cluster Summary and Utilization Rate**

Hillwood Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Bellevue Middle School	44	99,107	3,800	102,907	5	731	643	114%
Westmeade Elementary School	54	53,457	4,560	58,017	6	503	456	110%
H G Hill Middle School	44	85,645	760	86,405	1	623	591	105%
Harpeth Valley Elementary School	18	97,254	0	97,254	0	775	774	100%
Charlotte Park Elementary School	54	65,040	760	65,800	1	497	527	94%
Gower Elementary School	25	80,033	0	80,033	0	664	741	90%
Hillwood Comprehensive High School	61	224,106	0	224,106	0	1,200	1,727	69%
<b>Cluster Total/Average</b>	<b>43</b>	<b>704,642</b>	<b>9,880</b>	<b>714,522</b>	<b>13</b>	<b>4,993</b>	<b>5,459</b>	<b>91%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014. Note: Cameron Middle School only operated grade 8.

**Exhibit 6-24** shows that the Glencliff cluster has an overall utilization rate of 90 percent. The Glencliff cluster has two overcrowded campuses: Paragon Mills Elementary School and Glenview Elementary School, with utilization rates at 124 percent and 117 percent, respectively. Cameron Middle School has the lowest utilization rate at 15 percent and is being converted to Cameron College Prep Middle School. All other schools in the Glencliff cluster operate at the targeted utilization rate of 80 percent or higher.

**Exhibit 6-24  
Glenciff Facility Cluster Summary and Utilization Rate**

Glenciff Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Paragon Mills Elementary School	49	76,497	10,640	87,137	14	905	730	124%
Glenview Elementary School	8	89,180	3,040	92,220	4	830	711	117%
Fall-Hamilton Enhanced Option School	44	64,471	760	65,231	1	317	299	106%
Glenciff Elementary School	39	66,621	0	66,621	0	527	513	103%
John B Whitsitt Elementary School	14	67,300	0	67,300	0	544	551	99%
Glengarry Elementary School	52	65,436	0	65,436	0	474	508	93%
Glenciff Comprehensive High School	58	277,600	760	278,360	1	1,414	1,550	91%
Wright Middle School	49	126,395	1,520	127,915	2	856	963	89%
Cameron Middle School	75	125,669	0	125,669	0	120	803	15%
<b>Cluster Total/Average</b>	<b>43</b>	<b>959,169</b>	<b>16,720</b>	<b>975,889</b>	<b>22</b>	<b>5,987</b>	<b>6,628</b>	<b>90%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-25** shows that the Hunters Lane cluster operates at a utilization rate of 92 percent. Gateway Elementary School is overcrowded, based on the review team's sample target utilization of 111 percent or higher. In contrast, there are two schools that would be categorized as underutilized when using the review team's sample target rate of 80 to 110 percent. These schools are Hunters Lane Comprehensive High and Neelys Bend Middle with utilization rates of 78 percent and 73 percent respectively. A new facility is under construction to replace the existing Goodlettsville Middle School.

**Exhibit 6-25  
Hunters Lane Facility Cluster Summary and Utilization Rate**

Hunters Lane Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Gateway Elementary School	50	45,900	0	45,900	0	242	219	111%
Old Center Elementary School	54	50,554	1,520	52,074	2	367	333	110%
Neelys Bend Elementary School	61	56,656	3,040	59,696	4	456	420	109%
Bellshire Design Center	52	58,164	0	58,164	0	527	504	105%
Goodlettsville Middle School	77	89,487	1,520	91,007	2	538	517	104%
Goodlettsville Elementary School	60	57,688	2,280	59,968	3	440	423	104%
Taylor Stratton Elementary School	18	76,355	3,040	79,395	4	664	651	102%
Amqui Elementary School	14	79,708	2,280	81,988	3	641	646	99%
Madison Middle School	63	106,610	9,880	116,490	13	751	891	84%
Hunters Lane Comprehensive High School	28	272,812	0	272,812	0	1,610	2,056	78%
Neelys Bend Middle School	51	107,762	0	107,762	0	546	752	73%
<b>Cluster Total/Average</b>	<b>48</b>	<b>1,001,696</b>	<b>23,560</b>	<b>1,025,256</b>	<b>31</b>	<b>6,782</b>	<b>7,412</b>	<b>92%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-26** shows that the Pearl-Cohn cluster has an overall utilization rate of 84 percent. Two schools in the cluster: Park Avenue Enhanced Option School, and McKissack Middle School, have utilization below the review team's sample target utilization rate of 80 percent.

**Exhibit 6-26  
Pearl-Cohn Facility Cluster Summary and Utilization Rate**

Pearl-Cohn Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
John Early Museum Magnet Middle School	12	91,989	0	91,989	0	515	503	<b>102%</b>
Cockrill Elementary School	18	76,300	0	76,300	0	496	513	<b>97%</b>
Churchwell Elementary	56	111,768	0	111,768	0	532	594	<b>90%</b>
Buena Vista Enhanced Option School	83	65,470	0	65,470	0	358	418	<b>86%</b>
Pearl-Cohn Comprehensive Magnet High School	28	241,569	0	241,569	0	858	1,006	<b>85%</b>
Park Avenue Enhanced Option School	15	103,000	0	103,000	0	517	708	<b>73%</b>
McKissack Middle School	60	115,000	0	115,000	0	378	594	<b>64%</b>
<b>Cluster Total/Average</b>	<b>39</b>	<b>805,096</b>	<b>0</b>	<b>805,096</b>	<b>0</b>	<b>3,654</b>	<b>4,336</b>	<b>84%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-27** shows that the Maplewood cluster has an overall utilization rate of 71 percent. Shwab Elementary School, Hattie Cotton Elementary School, and Tom Joy Elementary School all have utilization rates that fall within the sample target utilization range of 80 percent to 110 percent. The remainder of the schools in the cluster, including Maplewood Comprehensive High School, have use rates in the underutilized range. Using the review team's utilization standards, Gra-Mar Middle School has the lowest utilization rate in the cluster at 48 percent. Gra-Mar Middle School is a candidate for consolidation or closure since its utilization rate has been below 55 percent for two consecutive years.

**Exhibit 6-27  
Maplewood Facility Cluster Summary and Utilization Rate**

Maplewood Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Shwab Elementary School	25	68,000	0	68,000	0	368	385	96%
Hattie Cotton Elementary School	18	67,000	760	67,760	1	450	475	95%
Tom Joy Elementary School	25	84,532	0	84,532	0	551	632	87%
Chadwell Elementary School	58	57,641	0	57,641	0	337	432	78%
Caldwell Enhanced Option School	77	62,211	0	62,211	0	278	378	74%
Glenn Elementary Enhanced Option School	25	54,760	0	54,760	0	177	252	70%
Maplewood Comprehensive High School	58	224,749	0	224,749	0	973	1,449	67%
Jere Baxter Middle School	17	90,120	0	90,120	0	433	719	60%
Gra-Mar Middle School	53	99,759	0	99,759	0	431	895	48%
<b>Cluster Total/Average</b>	<b>40</b>	<b>808,772</b>	<b>760</b>	<b>809,532</b>	<b>1</b>	<b>3,998</b>	<b>5,617</b>	<b>71%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-28** shows that the Stratford Cluster has an overall utilization rate of 71 percent. The Kirkpatrick Enhanced Option School has the highest utilization rate at 128 percent, indicating overcrowding. Based on the review team’s sample utilization target of 80 percent or higher, Dan Mills Elementary and Warner Enhanced Option School fall within the range. All other schools in the cluster fall in the range for underutilized schools.

**Exhibit 6-28  
Stratford Facility Cluster Summary and Utilization Rate**

Stratford Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Kirkpatrick Enhanced Option School	62	64,495	760	65,255	1	383	299	128%
Dan Mills Elementary School	14	73,807	0	73,807	0	559	570	98%
Warner Enhanced Option School	95	87,259	0	87,259	0	342	428	80%
Ross Elementary School	26	53,298	0	53,298	0	236	333	71%
Inglewood Elementary School	56	66,962	0	66,962	0	310	489	63%
Bailey Middle School	85	97,000	0	97,000	0	439	707	62%
Stratford Comprehensive High School	53	234,258	760	235,018	1	717	1,200	60%
Rosebank Elementary School	60	60,583	0	60,583	0	296	508	58%
Isaac Litton Middle School	76	102,961	0	102,961	0	339	585	58%
<b>Cluster Total/Average</b>	<b>59</b>	<b>840,623</b>	<b>1,520</b>	<b>842,143</b>	<b>2</b>	<b>3,621</b>	<b>5,119</b>	<b>71%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014.

**Exhibit 6-29** shows that the Whites Creek cluster has an overall utilization rate of 64 percent. Only Alex Green Elementary School and Bordeaux Enhanced Option School operate at utilization rates that fall within the sample target utilization range of 80 percent to 110 percent. Whites Creek Comprehensive High School operates at a utilization rate of only 62 percent.

**Exhibit 6-29  
Whites Creek Facility Cluster Summary and Utilization Rate**

Whites Creek Cluster	Age/ Average	Permanent Square Feet	Square Feet of Portables	Gross Square Feet	Number of Portables	Enrollment October 2013	Capacity	Percent Utilization Rate
Alex Green Elementary School	27	59,716	760	60,476	1	372	370	101%
Bordeaux Enhanced Option School	59	63,744	0	63,744	0	372	375	99%
Cumberland Elementary School	16	68,430	0	68,430	0	403	513	79%
Joelton Elementary School	25	62,600	0	62,600	0	305	428	71%
Robert E. Lillard Elementary	53	62,982	0	62,982	0	342	527	65%
Whites Creek Comprehensive High School	36	256,961	0	256,961	0	826	1,337	62%
Joelton Middle School (Temporarily located in Haynes Middle Health/Medical Science Design Center)	N/A	N/A	N/A	N/A	N/A	277	456	61%
Brick Church Middle School	13	89,830	0	89,830	0	173	823	21%
<b>Cluster Total/Average</b>	<b>33</b>	<b>664,263</b>	<b>760</b>	<b>665,023</b>	<b>1</b>	<b>3,070</b>	<b>4,829</b>	<b>64%</b>

Source: Metropolitan Nashville Public Schools, Student Assignment Services and Facility Planning & Construction Departments, December 2014. Note: Brick Church Middle School operated only grades 7 and 8 and is being converted to Brick Church College Prep Middle School.



## RECOMMENDATION 6-C.1

### **Optimize school facility utilization in all clusters as a component of the facility master planning process.**

The School System should develop a rolling three-year plan that is designed to optimize facility use. The plan should focus on opportunities for alleviating overcrowded and underutilized schools by redrawing both cluster and school zone boundaries. Identification and delivery of the most attractive instructional programs in the most cost-effective manner possible should also be a key component of the plan. To accomplish this goal, the School System will need to perform the following activities:

- Develop and implement a transparent, proactive community engagement process.
  - communicate changes in student enrollment trends to parents and stakeholders so that they are aware of the impact of overcrowding and underutilization of schools on an ongoing basis.
  - identify parent and stakeholder preferences and involve them in the decision-making process as to which schools may be impacted when changes are made.
- Redraw cluster and school zone boundaries, and develop strategies to balance enrollment and alleviate underutilized and overcrowded schools.
  - explore consolidating cluster boundaries and rezoning students in cases where the high school and some middle and elementary schools are underutilized in the same cluster (e.g., Maplewood, Stratford, and Whites Creek clusters). Identify ways to consistently invigorate enrollment at the elementary and middle schools that feed to these high schools; otherwise enrollment at the high school and within the feeder pattern may decline further over time. School utilization varies widely in the Hunters Lane and Pearl-Cohn clusters. The Hunters Lane cluster has three schools that are either overcrowded or approaching overcrowded status. There are also two schools in the cluster that are underutilized. The Stratford cluster has one school, Kirkpatrick Enhanced Option School, which is operating at a 128 percent utilization rate, while three other elementary schools are underutilized.
  - the School System should continue to use its Diversity Management Plan to ensure appropriate ethnic diversity, demographics, and economic ratios when redrawing attendance cluster or school zone boundaries to maintain the most diverse student population possible within each cluster and within each school zone.
  - identify opportunities for co-location and shared occupancy by two or more schools (e.g., a charter school co-locates with an underutilized school or two schools with low utilization, but different, innovative academic program offerings combine).
  - consolidate schools with low utilization rates and that are expensive to operate (schools that have fewer than 54 percent utilization for two consecutive years) so that funding can be diverted to more viable academic programming.

- Explore opportunities to expand permanent classroom space at overcrowded schools in the Overton, Hillwood, and McGavock clusters in addition to the new elementary schools that are planned for the Antioch and Hillsboro clusters.
  - explore the feasibility of renovating and expanding permanent classroom wings in overcrowded schools and reduce reliance on portables. The Overton cluster is using 77 portables, and the Antioch cluster is using 50 portables—both for classroom and administrative use. Portables are often more expensive to operate and maintain than permanent structures, on a square footage basis.
  - encourage collaboration with providers, as charter schools continue to expand, to target locations that will assist with relieving overcrowding, perhaps in the Antioch, Hillsboro, Overton, Hillwood, and McGavock clusters.
- Enhance academic programming at neighborhood schools.
  - identify additional academic and extracurricular programs to promote interest in school facilities and increase the number of lottery/themed magnet schools. All of the lottery schools, with the exception of the Haynes Middle Health/Medical Science Design Center, have utilization rates at 80 percent and above. Aggressively market the Haynes Middle Health/Medical Science Design Center to increase utilization at that school. If the utilization does not improve within the next two years, then explore a different magnet theme for the school, or elimination of the program, so that those funds can be used to support a more viable program.
  - continue to identify schools with low utilization rates that are also low-performing and low poverty. Redirect students from these schools to schools with higher student performance and higher family income levels (See **Observation 3-B** in the Charter School Chapter).
- Compile and maintain comparative operational and administrative cost data related to overcrowded and underutilized schools to better inform the decision-making process. For example, administrative, operational, and utility costs are proportionately higher for smaller and underutilized schools, when compared to schools that are functioning at full capacity or higher.

## FISCAL IMPACT

The School System can implement this recommendation with existing resources.

## **MAINTENANCE MANAGEMENT**

### OBSERVATION 6-D

**The Facility & Grounds Maintenance Department does not use a staff allocation model to determine the appropriate level of manpower required to execute maintenance operations.**

The Facility & Grounds Maintenance Department determines its staffing requirements for maintenance activities based on the backlog of work orders in the system and special projects typically requested by school administrators and central administrators. The review team saw no evidence of a staff allocation model that uses a systematic approach to determine maintenance staff; and this practice contributes to an ineffective distribution of workloads, low productivity, and potential overstaffing within the department. **Exhibit 6-30** compares staffing in the Facility & Grounds Maintenance Department to peer school systems selected by the School System in collaboration with the review team.

**Exhibit 6-30  
Facility & Grounds Maintenance Staffing Comparison  
Metropolitan Nashville Public Schools and Peers**

Variable	Metropolitan Nashville Public Schools	Duval County Public Schools (Jacksonville, FL)	Polk County Schools (Lakeland-Winter Haven, FL)	Shelby County Public Schools (Memphis, TN)
2013-2014 Fall Enrollment	82,863	124,686	97,902	149,234
Total Number of Schools (excluding charters (MNPS: Core/Lottery-129, Alternative Learning-4, Special Ed-3, Special-3)	139 (Excluding Charter Schools)	158 (Excluding Charter Schools)	147	233 (Excluding Charter Schools)
Maintenance/Grounds/Custodial Management, Supervision and Foreman	14	28		39
Supervisor and Project Manager	2			
Administrative and Clerical	3		6	9
Roof Asset	3			
General Maintenance – Masonry, Fencing, Maintenance	10			18
General Maintenance-Roofing	4			
Painters/Glass	26	38		13
Carpenters and Helpers	27	18		32
Plumbers	16	18		30
HVAC Technicians	28	45		36
Energy Management (MNPS-HVAC Technicians)	2	3		4
Locksmith (MNPS-Carpentry)	10	11		5
Electricians	16	24		40
Electronics	16			
Mechanics				5
Environmental	2			
Sign Shop	1			
Warehouse	1			
Other – All Trades (Polk) (A)			230	
<b>Total Maintenance Positions Excluding Grounds and Facility Planning and Construction Positions (B)</b>	<b>181(C)</b>	<b>185</b>	<b>236</b>	<b>231</b>
<b>Maintenance Positions per School</b>	<b>1.30</b>	<b>1.17</b>	<b>1.61</b>	<b>0.99</b>
<b>Peer Average (without Metropolitan Nashville Public Schools)</b>	<b>1.21</b>			
<b>Metropolitan Nashville Public Schools Over (Under) Peer Average</b>	<b>.09</b>			
<b>Percent Over (Under) Peer Average</b>	<b>7%</b>			

Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department and Peer Survey, July 2014.  
 Note (A): Polk County Schools provided total maintenance positions for all trades in one line item.  
 Note (B): Analysis used only maintenance positions to normalize data for peer comparisons. The School System outsources grounds maintenance services and the Facility Planning & Construction Department does not perform maintenance functions.  
 Note (C): The 181 positions noted equates to the 199 positions shown on the Facility & Grounds Maintenance organization chart less 18 positions assigned to general services that performs work on the School Systems athletic grounds.

Comparing maintenance staffing standards among school districts is inherently difficult, uncertain, and complex. Maintenance staffing levels often are based on the amount of space and facilities workers must maintain. Many variables come into play. For example, school district size, age of facilities, extent of outsourcing, geographical dispersion of facilities, amount of green space that must be maintained, and a host of other variables. As a result, comparisons will not be definitive; however, comparisons could be a starting point for evaluating a school district's own staffing and structure.

The comparison in **Exhibit 6-30** is instructive in the sense that it provides a context for discussion about developing an in-house maintenance staff model. **Exhibit 6-30** shows the School System has 1.3 full time equivalent maintenance positions per school, which is 7 percent higher than the peer average for full time equivalent maintenance positions per school. While this difference might be wholly justified given the differences between school districts, developing a staffing model is also justified. The Florida Department of Education has developed a maintenance and operations administrative guidelines for school districts in the state. The manual can be found at the following link:

<http://www.fldoe.org/finance/edual-facilities/maintenance-operations-administrative-stml>

The purpose of the manual is “to provide an update of acceptable and effective maintenance and operations management practices and current standards for educational facilities. It is also intended to provide a comprehensive framework for delivering beneficial and cost-effective services at each school”

The manual acknowledges the complexity inherent in organizing maintenance operations.

“In developing new organizational plans for maintenance and operations departments or modifying existing ones, administrators should be aware of the myriad circumstances that must be taken into consideration. While the ultimate objective is to create the “best” organizational structure that is required to maintain a particular educational facility, administrators should not be overly concerned with creating an “ideal” structure that fits all needs. Given the dynamics of maintenance and operations functions and the rate of change occurring in physical plants, it is likely that any organizational plan that is proven to be effective today may have to be modified within a year's time to reflect added responsibilities, new priorities, and changes in work procedures. Based on these circumstances, one criterion that is essential for defining the organizational structure of a maintenance and operations department is the ability to accurately define the overall scope of work required to adequately maintain a facility.”

It is important to note that benchmark data related to industry standards is strictly quantitative and does not reflect differences in quality or service levels. Benchmark data provides a starting point and uniform unit of measure to compare similar operations and function. The School System should primarily use this data to look for opportunities to “right-size staffing, improve productivity levels of maintenance staff, and improve the department's operational performance.

#### **RECOMMENDATION 6-D.1**

**Develop an allocation model to determine the appropriate staffing levels for the Facility & Grounds Maintenance Department to enhance productivity levels in the most efficient, cost-effective manner.**

The director of the Facility & Grounds Maintenance Department should analyze the current staffing levels, disparate work activities, and productivity per full time equivalent maintenance position and develop an allocation model to determine the most cost-effective method to allocate staff to maintenance activities. The director of Facility & Grounds Maintenance can develop the allocation model using a variety of criteria such as work activity or square footage of schools and administrative facilities per maintenance full time equivalent; maintenance full time equivalents per number of schools and administrative facilities maintained; and maintenance full time equivalent per student. Once the director develops the model and applies it to the School System's maintenance function, the top priority must be to reduce excessive staffing levels and thereby reduce administrative costs.

### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

### **OBSERVATION 6-E**

**The Facility & Grounds Maintenance Department currently uses a geographic zone approach to deploy staff for only four out of nine of its trade areas when performing routine, preventative, and emergency maintenance. This approach is often found to be more productive and cost-effective, especially in large school districts.**

The School System uses a geographic zone maintenance approach for its heating, ventilation, and air conditioning (HVAC), electrical, plumbing, and glass trades. The trade areas that cover painting, carpentry, general maintenance, electronics, and general services have not been using a geographic zone approach.

Best practice management methods for many large school districts use a geographic zone approach to deploy maintenance staff where multi-functional trades such as paint, carpentry, general maintenance, general services, electrical, plumbing, and HVAC are replicated in each organizational unit. This management practice is particularly appropriate for a city like Nashville, where the geographic boundaries of the School System are approximately 533 square miles. Another best practice under a geographic zone approach is to create a regular schedule for each school or administrative building to have all of its maintenance needs addressed (both routine and preventative) during each visit.

As part of our evaluation process, the review team toured 32 schools during the onsite visit and found all to be in generally good condition; however, at least one or more maintenance issues were identified at every school toured—which, when addressed could improve the visual aesthetics and enhance the safety of the learning environment.

**Exhibit 6-31** provides photographic examples of maintenance issues that were identified during the school tours.

**Exhibit 6-31**

**Sample Photos of Routine Maintenance Needs at Metropolitan Nashville Public Schools  
Identified During School Tours**

**PHOTO #1: Cohn High School**  
*Peeling paint on restroom stall*



**PHOTO #2: Antioch High School**  
*Cracked brick on exterior wall*



**PHOTO #3: Glenview Elementary School**  
*Damaged exterior building side roof surface*



**PHOTO #4: Maplewood High School**  
*Floor tile damage*



**Exhibit 6-31**

**Sample Photos of Routine Maintenance Needs at Metropolitan Nashville Public Schools Identified During School Tours (Cont'd)**

**PHOTO #5: Cole Elementary School**  
*Duct disconnected from unit*



**PHOTO #6: Wright Middle School**  
*Missing exit sign*



Source: McConnell Jones Lanier & Murphy LLP photographs from onsite visit school tours, February and March 2014.

Results from the employee opinion survey administered by the review team support these observations. **Exhibit 6-32** shows that 84.4 percent of central administrators and 70.5 percent of teachers, respectively, agree or strongly agree that the School System’s emergency responses for maintenance are handled promptly. Response rates from principals and assistant principals were even higher, at 88.5 percent, for the same question. In contrast, however, when asked about whether or not the buildings were maintained in a timely manner, only 62.5 percent of central administrators strongly agreed or agreed that this was being done. A significant percentage of support staff and teachers disagree or strongly disagree with the same question as central administrators.

**Exhibit 6-32**

**Facility & Grounds Maintenance Survey Results**

Question		Percentage Responses			
	Number of Survey Responses	Agree/ Strongly Agree or Somewhat Agree	Disagree or Strongly Disagree	N/A	Total
<b>Emergency maintenance is handled promptly</b>					
<b>Survey Group</b>					
Central Administrators	62	84.4%	6.3%	9.3%	100.0%
Principals/Assistant Principals	104	88.5%	11.5%	0.0%	100.0%
Support Staff	438	81.3%	11.6%	7.1%	100.0%
Teachers	1,208	70.5%	23.8%	5.7%	100.0%
<b>Buildings are properly maintained in a timely manner.</b>					
<b>Survey Group</b>					
Central Administrators	62	62.5%	29.7%	7.8%	100.0%
Principals/Assistant Principals	104	78.9%	21.1%	0.0%	100.0%
Support Staff	438	59.4%	37.2%	3.4%	100.0%
Teachers	1,208	50.3%	47.7%	2.0%	100.0%

Source: McConnell Jones Lanier & Murphy LLP Surveys of Central Administrators, Principals/Assistant Principals, Support Staff, and Teachers, May 2014.

During the onsite visit, the review team was told by the HVAC trade unit that it has devised a system for personnel assigned to share trucks and equipment and it has established short-term goals to maximize productivity, which include the following:

- provide a 24 hour response time for all work requests submitted via SchoolDude work order system;
- provide an immediate response time to all emergencies;
- provide a three-month schedule for replacement of HVAC filters at each site;
- train and educate every technician to allow them to be masters in HVAC;
- document and catalog all HVAC equipment systemwide; and
- implement Environmental Protection Agency and Occupational Safety & Health Administration safety practices.

Some of the main advantages to implementing a geographic zone approach for all trade areas are noted below:

- trade staff is deployed to a more concentrated area within the School System's geographic boundaries, which drastically reduces travel time and fuel usage;
- trade staff productivity is increased because a higher number of work orders can be responded to and non-productive time is decreased because work orders are allowed to accumulate and be addressed with fewer overall trips to the school or building site;
- the overall number of maintenance vehicles needed is reduced and the life-cycle of vehicles increases; and
- faster response to routine and emergency work order requests is achieved and trade staff can better stay on task for handling preventative maintenance needs.

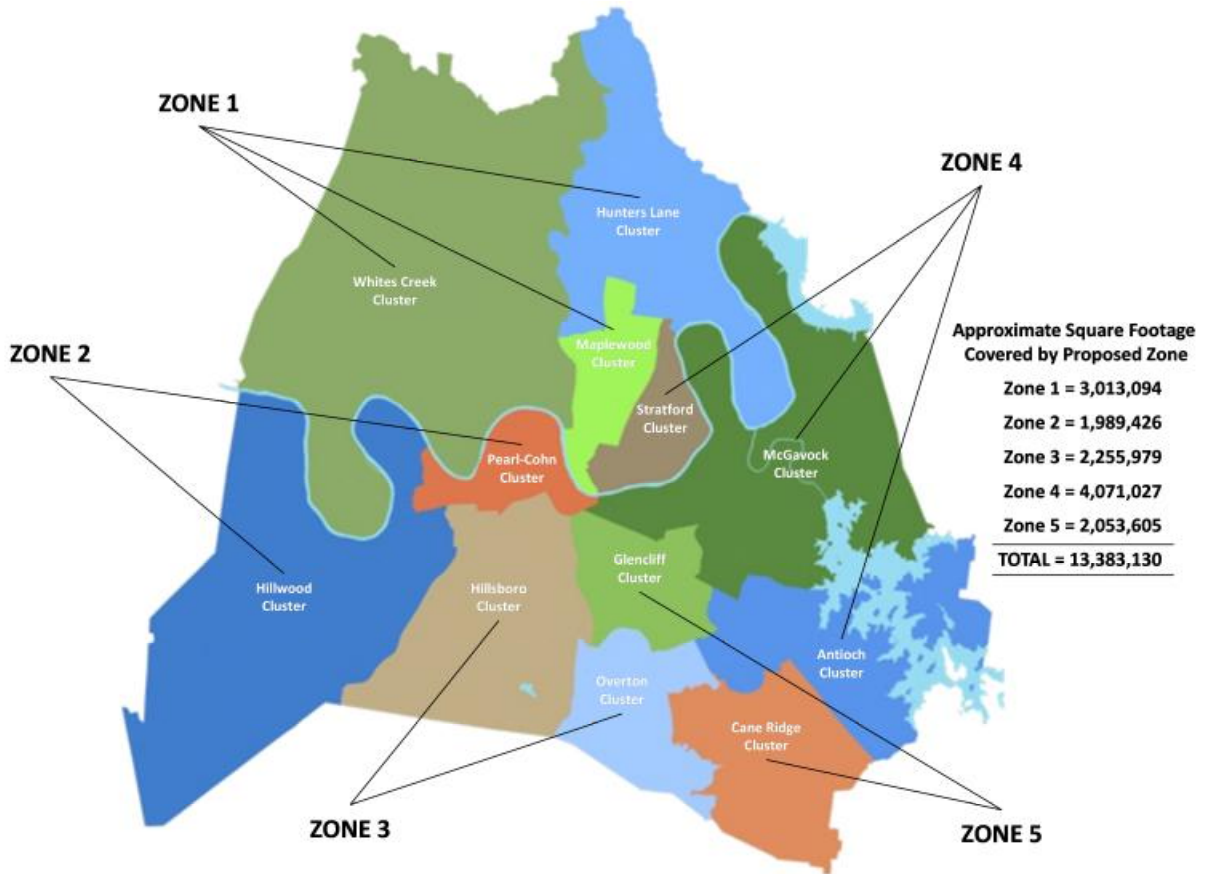
#### **RECOMMENDATION 6-E.1**

**Expand the geographic zone approach for deployment of trade staff for routine, preventative, and emergency maintenance needs.**

**Exhibit 6-33** provides an illustration of the five geographic zones proposed, which represent a combination of several existing high school clusters. The number of multi-functional trade staff assigned to each geographic zone should be determined based on the building square footage assigned to the zone and historical maintenance needs of the buildings.



**Exhibit 6-33  
Proposed Geographic Zone Model for Facility & Grounds Maintenance Department Trades**

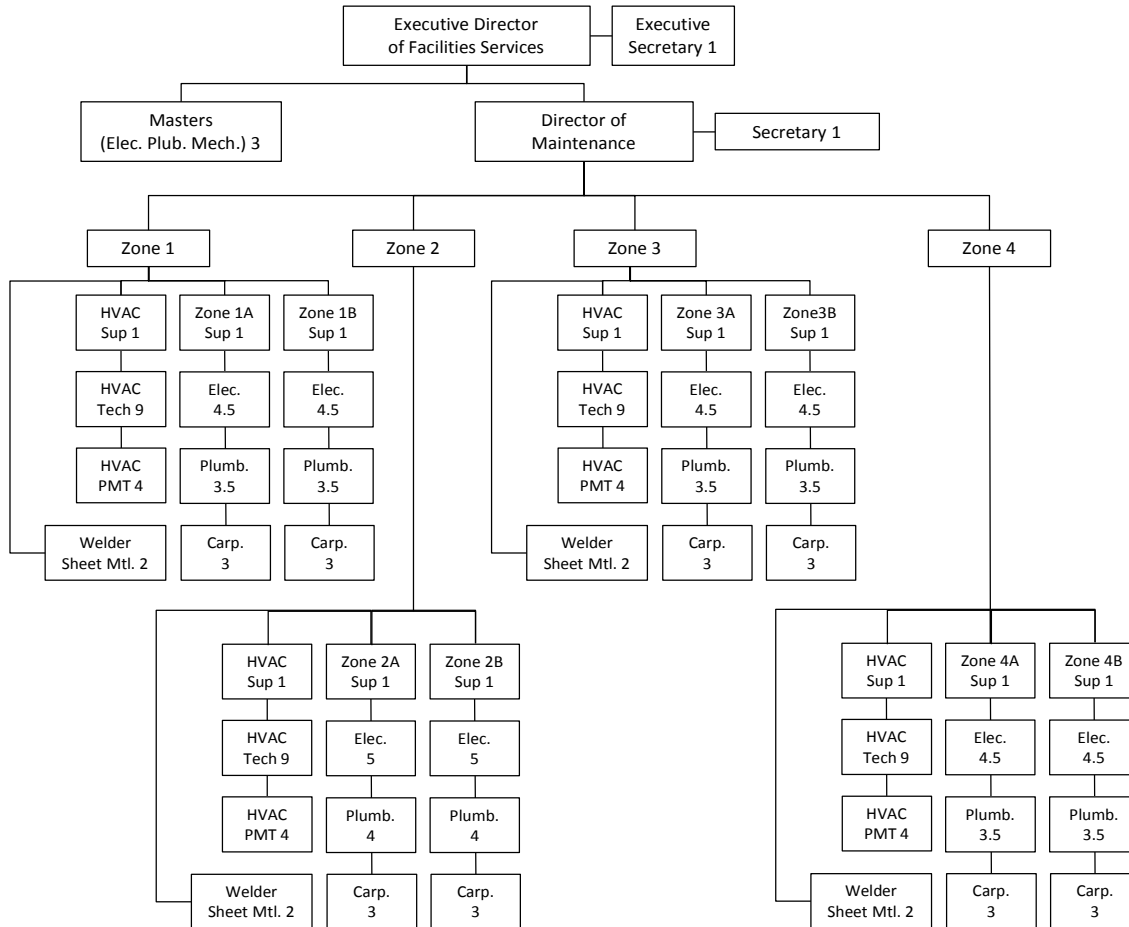


Source: McConnell Jones Lanier & Murphy LLP Review Team.

A maintenance schedule should be developed for each school campus and administrative building using historical maintenance data from the SchoolDude Maintenance Direct work order system to determine the estimated number of days that should be spent at each building to complete routine and preventative work orders. Each school or administrative building should be scheduled for routine and preventative maintenance at least every two to three months. Prior to the scheduled maintenance visit, all work orders should be compiled so that required supplies and materials are readily available. Once all work orders have been completed for that maintenance visit, quality control inspections should be performed by the trade crew supervisor or trade foreman, and the school principal or building administrator, to ensure all work meets the expected standard. The trade crews should also have time planned each day to respond to emergency work orders as needed. After six months of implementing the geographical zone structure, the need for separate preventative maintenance crews should be assessed.

**Exhibit 6-34** provides a sample facility services organization structure for Shelby County Public Schools (Memphis, Tennessee), which illustrates how a zone maintenance approach is configured.

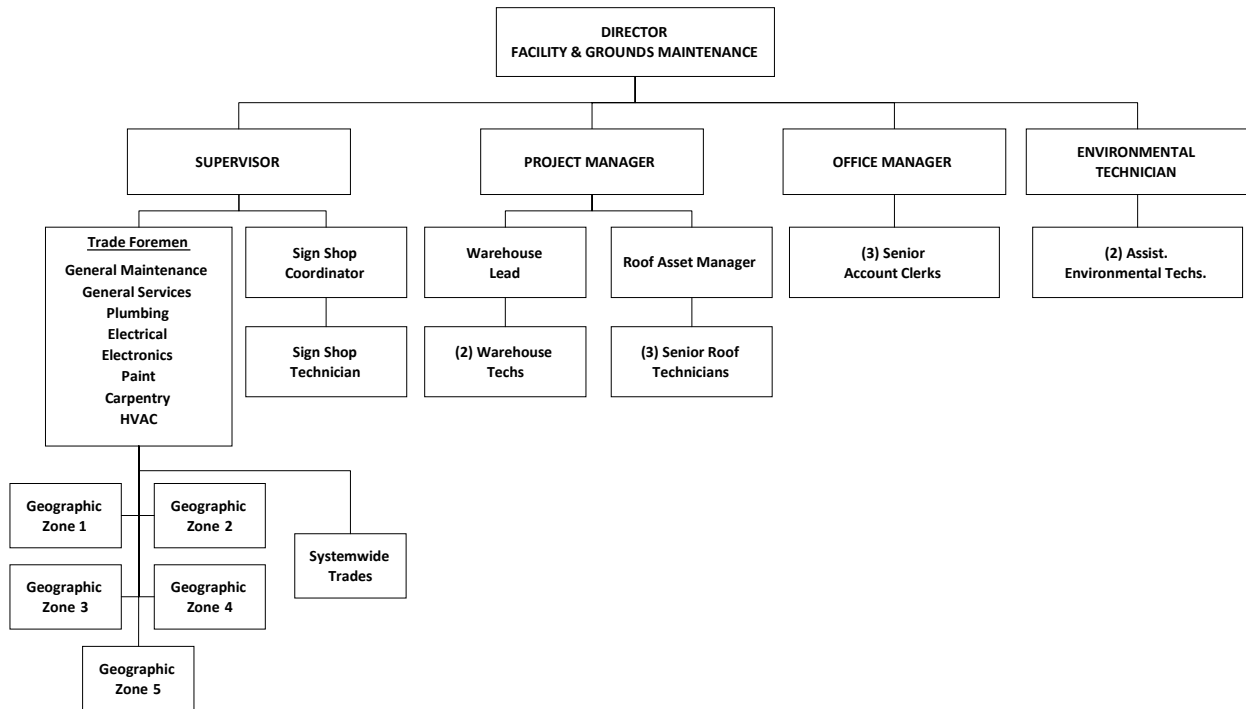
**Exhibit 6-34**  
**Sample Zone Maintenance Organization**  
**Shelby County Public Schools Facilities Service Department**



Source: Shelby County Public Schools, Facilities Services Department, August 2014.

**Exhibit 6-35** presents the proposed organization structure that illustrates how geographic zones would be managed in the School System’s Facility & Grounds Maintenance Department. For example, trade staff from each discipline such as plumbing, electrical, paint, carpentry, and HVAC should be assigned to support specific geographic zones. Trade foremen should continue to supervise and oversee trade staff that report to them. Trade staff with fewer employees such as locksmiths and cabinet makers should continue to report to the foreman that oversees their area; however, they should be assigned to the systemwide trade organizational unit, and support all geographic zones.

**Exhibit 6-35  
Metropolitan Nashville Public Schools Proposed High Level Facility & Grounds Maintenance  
Organization**



Source: McConnell Jones Lanier & Murphy LLP.

**FISCAL IMPACT**

The School System can implement this recommendation with existing resources.

**OBSERVATION 6-F**

**The School System does not fully leverage the functionality and features of its computerized work order management system to produce management reports to improve the overall performance and cost effectiveness of the Facility & Grounds Maintenance Department.**

The Facility & Grounds Maintenance Department uses SchoolDude Maintenance Direct corrective maintenance software as its computerized work order management system and is utilizing four out of eight of the main management reports. Maintenance Direct is a Cloud-based corrective work order management system that allows the department to manage the maintenance work order process for schools and administrative facilities throughout the School System from “request through completion.” According to a description of the features and functionality of Maintenance Direct listed in SchoolDude’s website, the system features include the following:

- allows administrators in schools and administrative facilities to submit work requests from their respective sites;
- routes, prioritizes, and ranks work order requests in real time by project, location, budget, and available inventory;
- enables maintenance staff to receive requests in the field, via mobile device, and notifies end-users about the status of their requests; and
- tracks all work orders submitted, and generates customizable reports to calculate budget and staffing needs.

School administrators and employees in the School System’s administrative facilities initiate most maintenance work order requests through SchoolDude, and the remaining requests are initiated through direct telephone calls to the Facility & Grounds Maintenance Department. The department prioritizes the work orders and assigns the maintenance task to the appropriate trade crew or individual. Once the crews or individuals complete the assigned maintenance tasks, the completed work order is returned, and SchoolDude updates its status “completed.” Once the system updates the status of the work order as “completed,” the work order is forwarded to the account clerk for any further processing.

Although SchoolDude has a variety of standard and customizable management reports that will allow the Facility & Grounds Maintenance Department to improve the overall performance of the work order process, the department does not effectively leverage the information these reports can provide to improve the performance of the School System’s maintenance function. For example, when the review team requested copies of all reports management used to track, monitor, and improve the maintenance work order process, they provided four reports that they routinely use: (1) Location Expenditures Summary, (2) Craft Expenditures Summary, (3) Detail Employee Cost Report and (4) Emergency Work Order Request. These reports do not track and measure responsiveness or overall performance—critical metrics for improving the service levels to schools and administrative facilities.

**Exhibit 6-36** presents a sample of the top standard and customizable reports included in SchoolDude’s Maintenance Direct work order management system.

**Exhibit 6-36**
**Sample Top Standard Work Order Management Reports in SchoolDude Maintenance Direct**

Report Description	Functionality	School System Uses Report?
<b>Work Order Summary 2:</b> <ul style="list-style-type: none"> <li>Report includes the work order status, the current "assigned to", requester, day's aged, total costs, and more.</li> <li>It can be grouped by location, craft, purpose, and "assigned to," and provide a total for each group as well as a grand total.</li> </ul>	<ul style="list-style-type: none"> <li>High level all-encompassing summary report.</li> <li>Shows date work order created, target completion date, actual completion date, days aged, labor hours, and costs.</li> <li>Helps maintenance managers keep abreast of what is going on in the organization.</li> </ul>	<b>No</b>
<b>Location Summary:</b> <ul style="list-style-type: none"> <li>Report provides a roll-up for each location, including total labor hours and labor costs, material costs, total cost by facility.</li> </ul>	<ul style="list-style-type: none"> <li>Breakdown of how resources were allocated to each location.</li> <li>Tracks labor hours and costs, materials costs, sales tax, total costs, cost per student, and cost per square foot by location.</li> </ul>	<b>Yes</b>
<b>Craft Summary:</b> <ul style="list-style-type: none"> <li>Report includes the number of hours dedicated to each craft, the number of work orders per craft, and the cost for labor and materials.</li> <li>Includes total percentage of work each craft accounts for.</li> </ul>	<ul style="list-style-type: none"> <li>Breakdown of where resources were spent in relation to the "type" of work being done.</li> <li>Tracks labor hours and costs, materials costs, sales tax, the number of work orders closed and in progress, average hours per work order, and average cost per work order by craft and location.</li> </ul>	<b>Yes</b>
<b>Purpose Summary:</b> <ul style="list-style-type: none"> <li>Report breaks down the number of work orders dedicated to each purpose code—such as preventive maintenance, reactive maintenance, tornado damage, capital request, etc.</li> <li>Includes total labor hours, labor and material costs, average hours, and average cost per work order.</li> </ul>	<ul style="list-style-type: none"> <li>Tracks and reports how resources were allocated based on the reason "why" requests were entered into the system.</li> </ul>	<b>No</b>
<b>Detail Employee Cost Report:</b> <ul style="list-style-type: none"> <li>Report provides a breakdown of each employee and the total number of hours they have tracked for a given reporting period.</li> <li>Includes the average number of hours each employee enters per work order, the average number of days it takes them to complete a work order, and the total number of work orders they worked on during the time period selected.</li> </ul>	<ul style="list-style-type: none"> <li>Tracks and manages the work load of each maintenance employee.</li> <li>Can generate report for a single employee, a team of employees, or all employees.</li> </ul>	<b>Yes</b>
<b>Transaction Detail (To Excel):</b> <ul style="list-style-type: none"> <li>Reports transaction type, description, quantity, cost, etc., as well as the work order description, location, craft, purpose code, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Can open report with Excel to create meaningful and powerful charts and tables to illustrate employee's workload, total costs allocated to various vendors and suppliers, etc.</li> </ul>	<b>No</b>

**Exhibit 6-36**
**Sample Top Standard Work Order Management Reports in SchoolDude Maintenance Direct (Cont'd)**

Report Description	Functionality	School System Uses Report?
<b>Budget Report:</b> <ul style="list-style-type: none"> <li>Report shows year-to-date costs from all work orders marked with a specific budget code, beginning budget amount, percent of budget spent, and remaining fiscal year amounts.</li> </ul>	<ul style="list-style-type: none"> <li>Tracks budget status by budget code.</li> </ul>	<b>No</b>
<b>Emergency Work Order Report:</b> <ul style="list-style-type: none"> <li>Report shows work order description, location, labor hours, labor cost, inventory cost, and total cost.</li> </ul>	<ul style="list-style-type: none"> <li>Tracks and manages emergency work orders.</li> </ul>	<b>Yes</b>

Source: Description of "Top Maintenance Direct Reports" provided by the Metropolitan Nashville Public Schools' Client Advisor at SchoolDude, July 2014.

**Exhibit 6-36** also shows that the Facility & Grounds Maintenance Department is using only four of the eight sample reports considered as "Top Maintenance Direct Reports." In addition, the Facility Planning & Construction Department does not specifically track labor and material costs for construction project. The department tracks the construction costs, but typically by either the various components/systems of the building or by the square footage costs in the contract with Heery International. Heery International is required to invoice time and expenses to each specific project. This data is not currently captured for the Metropolitan Nashville Public Schools project managers.

The interim director of the Facility & Grounds Maintenance Department, who was a supervisor in the department, acknowledged that he and other users of SchoolDude were not fully aware of Maintenance Direct's reporting capabilities. More significantly, the primary users of Maintenance Direct did not receive adequate training on how to use the management reporting and analytics features of the system to improve routine, corrective maintenance in schools and administrative facilities. As a result, the perception of the lack of responsiveness of the maintenance staff in completing work orders is a concern for support staff and teachers. The results from the opinion survey administered by the review team seem to support this lack of responsiveness. When asked if "buildings are properly maintained in a timely manner," 59.4 percent of support staff and 50.1 percent of teachers agreed or strongly agreed with this statement, while 37.1 percent of support staff and 47.8 percent of teachers disagree or strongly disagree with the same question.

Because Facility & Grounds Maintenance has not fully utilized the management reporting capabilities of the SchoolDude Maintenance Direct work order system, the department cannot monitor the overall performance, cost effectiveness, and customer service levels of the maintenance operation. Accordingly, the leadership within the department cannot effectively assist school and central administrators with goal-setting or establishing criteria to evaluate the effectiveness of the maintenance program, maintenance teams, or individual staff.

**RECOMMENDATION 6-F.1**

**Provide extensive training on the management reporting and analytical capabilities of the SchoolDude Maintenance Direct work order management system.**

The School System's director of Facility & Grounds Maintenance should provide mandatory training in the use of the management and analytical reporting capabilities of the Maintenance Direct work order management system for members of the department. This mandatory training must focus on using the management and analytical reporting capabilities of the work order management system to establish performance standards to define and document the time required to complete various maintenance activities, expected levels of responsiveness, expected quality levels, and the cost-effectiveness of completing specific maintenance jobs. The department will be able to leverage this extensive training to improve the performance and cost-effectiveness of the School System's maintenance program.

**FISCAL IMPACT**

The School System can implement this recommendation with existing resources, as technical assistance is available through an online format and telephone support. Any additional training required is provided at the cost agreed upon with the vendor.

**OBSERVATION 6-G**

**The Facility & Grounds Maintenance Department has not fully implemented a preventive maintenance program or predictive maintenance plan, nor has it developed a preventive maintenance schedule for each building to address ongoing school maintenance issues.**

Although the Facility & Grounds Maintenance Department has not fully implemented a comprehensive preventative maintenance plan or schedule, the department primarily conducts its preventative maintenance program in maintenance shops supporting systems requiring annual certifications. These systems include fire alarm, storm water, and heating, ventilation and air conditioning. The HVAC Shop has a preventative maintenance plan which includes changing filters quarterly, checking belts, greasing motors, and other tasks. Other shops maintain buildings with no moving parts; therefore, it is difficult to prevent damage in such areas. Accordingly, those shops (for example, Roof Asset Shop, Electrical Shop, and Paint Shop) have limited preventative maintenance plans.

Moreover, the Facility & Grounds Maintenance Department outsources preventative maintenance on chillers and boilers to private contractors, which is typically included in a preventative maintenance program.

**Exhibit 6-37** summarizes the preventative maintenance tasks identified by the department's division managers, and indicates the lack of a scheduled and comprehensive preventative maintenance program.

**Exhibit 6-37  
Metropolitan Nashville Public Schools  
Divisions' Description of Preventative Maintenance Practices – Planned and Unplanned**

Area	Description of Preventative Maintenance Practices
<b>Electronic Shop</b>	<ul style="list-style-type: none"> <li>• Certify fire alarm systems at each school.</li> <li>• Service and tag fire extinguishers at each school and location at least two to three times a year.</li> </ul>
<b>General Maintenance Shop</b>	<ul style="list-style-type: none"> <li>• Check the operating systems of bleachers, and grease.</li> <li>• Check stadiums and gyms for loose handrails and unsightly conditions.</li> <li>• Check playgrounds for faulty equipment.</li> </ul>
<b>Carpenter Shop</b>	<ul style="list-style-type: none"> <li>• The preventive maintenance program will be utilized once all the security locks are installed.</li> <li>• When completing a work order, staff should observe and fix any other carpenter-related issues.</li> </ul>
<b>Paint Shop</b>	<ul style="list-style-type: none"> <li>• Paint all football goal posts before every season.</li> <li>• Try to paint two high school football complexes every summer.</li> <li>• Try to seal the windows in various schools before cold weather.</li> <li>• Seal all wood bleacher boards.</li> </ul>
<b>Roof Asset Shop</b>	<ul style="list-style-type: none"> <li>• Began performing some preventative maintenance items last year. Limited on funds and employees and not able to implement the full use of preventative maintenance at this time.</li> <li>• Plan to routinely clean and inspect roofs, clean drains, gutters, and areas of debris—which will help prolong the life expectancy of roof systems.</li> </ul>
<b>Environmental Shop</b>	<ul style="list-style-type: none"> <li>• Wetting P-traps (plumbing fixture) before they go dry in areas that have a history of sewer gas.</li> <li>• Also inform the principal or custodian when dry traps are discovered so that work orders will not have to be submitted to solve these problems. Also suggest to the contractors—who screen and coat gym floors—to tape the exit doors to the gym to prevent the volatile smell from entering schools once they refinish them. When they fail to do this, then the Division's staff must do this to resolve odor concerns that result.</li> </ul>
<b>HVAC Shop</b>	<ul style="list-style-type: none"> <li>• Filter replacement by internal personnel quarterly. There are six HVAC filter trucks (52,000 filters a year).</li> <li>• Contractors perform preventive maintenance of central plant equipment, including water treatment for closed loop water systems, chillers, cooling towers, and boilers.               <ul style="list-style-type: none"> <li>– Water treatment for closed and open loop water systems.</li> <li>– Chiller preventative maintenance</li> <li>– Cooling tower preventative maintenance</li> </ul> </li> </ul>
<b>Plumbing Shop</b>	<ul style="list-style-type: none"> <li>• Winterize all stadiums after football season ends. This includes any irrigation systems as well as the back flow preventers.</li> <li>• Turn on all backflow preventers and check them out for leaks and functionality in the spring.</li> </ul>



**Exhibit 6-37**
**Metropolitan Nashville Public Schools**
**Divisions' Description of Preventative Maintenance Practices – Planned and Unplanned (Cont'd)**

Area	Description of Preventative Maintenance Practices
<b>Electrical Shop</b>	<ul style="list-style-type: none"> <li>• Preventative maintenance is done with other work order requests.</li> <li>• When wiring computer labs, if the lab needs five circuits, will pull two extra for future use.</li> <li>• If bulbs are out in an auditorium, replace them all instead of just the ones that are out, based on knowing how long the bulbs should last.</li> <li>• When pulling a panel cover for any reason, all hot wires and neutrals are tightened (they work loose over time and cause burn ups and shorts).</li> </ul>
<b>General Services</b>	<ul style="list-style-type: none"> <li>• Topping trees before the winter.</li> <li>• Removing limbs that are hanging over the roofs of schools to prevent clogging of the gutter system.</li> <li>• Landscaping and mulching in areas that are highly visible.</li> </ul>

Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Division Managers, February 2014.

Preventative maintenance is defined as planned actions undertaken to retain an item at a specified level of performance by providing repetitive scheduled tasks that prolong system operation and useful life. Tasks include inspection, cleaning, lubrication, and service and/or replacement conducted at regularly-scheduled intervals, based on average statistical or anticipated lifetime, or both.

Predictive maintenance techniques are designed to help determine the condition of in-service equipment in order to predict when maintenance should be performed. This approach promises cost-savings over routine or time-based preventative maintenance since tasks are performed only when warranted. The benefit of predicted maintenance is to allow convenient scheduling of corrective maintenance, and to prevent unexpected equipment failures. The key is "the right information at the right time". By knowing which equipment needs attention, maintenance work can be better planned (such as spare equipment parts, human resources, and other resources), and what would have been "unplanned-stops" are transformed to shorter, fewer "planned stops"—thus, increasing plant availability.

Other potential advantages include increased equipment lifetime, increased plant safety, fewer accidents with negative impact on the environment, and optimized spare parts handling. Predictive maintenance evaluates the condition of equipment by performing periodic or continuous (online) equipment condition monitoring. The ultimate goal of predictive maintenance is to perform maintenance at a scheduled point in time when the maintenance activity is most cost-effective and before the equipment loses performance within a threshold. This is in contrast to time- and/or operation count-based maintenance, in which a piece of equipment gets maintained, whether it needs it or not. Time-based maintenance is labor intensive, ineffective in identifying problems that develop between scheduled inspections, and is not cost-effective. Reliability-centered maintenance emphasizes the use of predictive maintenance techniques, in addition to traditional preventive measures.

Development of a preventative maintenance program is a critical component of a school system’s planning and budgeting for ongoing maintenance. The use of proactive maintenance programs, better known as a preventive maintenance program, reduces costs by routinely evaluating the cost to maintain specific facility programs and implementing strategies to reduce labor and long-term maintenance costs.

Typical preventive maintenance programs contain characteristics which include the following:

- list of equipment that require repair;
- detailed schedule of the cost of repair;
- timeline schedule for completion of projects; and
- inspection and maintenance procedures.

**Exhibit 6-38** presents the preventative maintenance program reported by peer school districts indicating inconsistent practices among the school systems.

**Exhibit 6-38  
Metropolitan Nashville Public Schools  
Peer Schools Preventative Maintenance Program**

Survey Question	Metropolitan Nashville Public Schools	Atlanta Public Schools	Duval County Public Schools	School Board of Polk County	Shelby County Schools
<b>General Preventative Maintenance</b>	Varies by shop. See Exhibit 6-37 above.	Conduct ongoing audits of the buildings including restrooms, lighting, ceiling tile, stairs, floors, paint, furniture, sprinklers, hoods, gutters, windows, etc. Spend approximately \$1,500,000 annually.	Plans and executes over 23,000 preventative maintenance work orders per year. Estimated cost is \$3,400,000.	Does not have a preventative maintenance program.	Work order system generates preventative maintenance tickets for filter changes, oil testing, and various other items.
<b>Heating, Ventilation, and Air Conditioning (HVAC) Preventative Maintenance</b>	No response. See Exhibit 6-37 above.	HVAC-Filter contract every 60 days; open/closed loop water treating pending, coil cleaning contract. Spend \$400,000 annually.			

**Exhibit 6-38**  
**Metropolitan Nashville Public Schools**  
**Peer Schools Preventative Maintenance Program (Cont'd)**

Survey Question	Metropolitan Nashville Public Schools	Atlanta Public Schools	Duval County Public Schools	School Board of Polk County	Shelby County Schools
<b>Challenges and Resolutions</b>	No response.	<ul style="list-style-type: none"> <li>• There was non-standardization of manufacturers/systems/equipment; tightened guidelines and standards.</li> <li>• Issue with cleanliness of restrooms; using epoxy floors.</li> <li>• Issue with flooding by stuffing paper towels in the sinks; changed to metered faucets to control water usage.</li> <li>• Handrails required regular painting; changed to all stainless touch components.</li> </ul>	More funding needed.	More funding needed.	Lack of manpower; resolved by adding machinery to replace manpower.

Source: McConnell Jones Lanier & Murphy LLP Peer Survey, June 2014.

Facilities maintenance best practices show that a widely-used strategy to contain maintenance operations costs involves developing and implementing a preventive maintenance program. Preventative maintenance provides a planned approach—designed to avoid equipment breakdowns and prevent small problems from escalating into major ones. **Exhibit 6-39** presents an excerpt from a sample preventive maintenance program.

**Exhibit 6-39  
Sample Preventive Maintenance Program Excerpts**

Area	Component	Inspection & Repair (3-6 Month Intervals)	Inspection & Repair Annually	Inspection & Repair (2-5 Year Intervals)	Inspection & Replacement (7-10 Year Intervals)	Inspection & Replacement (12-15 Years)
<b>Exterior</b>	Roof		X	X		X
	Roof Drainage		X	X		
	Windows & Glass		X	X	X	
	Masonry		X	X		
	Foundations		X			X
	Joints & Sealants		X		X	
<b>Equipment</b>	Belts & Filters	X				
	Motors & Fans	X		X		X
	Pipes & Fittings	X			X	
	Ductwork		X		X	
	Electrical Controls		X		X	
	Heating Equip.	X			X	
	Air-conditioning Equip.	X			X	
<b>Interior</b>	Doors & Hardware		X			X
	Wall Finishes		X			X
	Floor Finishes		X		X	
<b>Site</b>	Parking & Walks		X	X		
	Drainage		X	X		
	Landscaping	X			X	
	Play Equipment		X		X	

Source: Developed by McConnell Jones Lanier & Murphy LLP.

Many districts establish regularly-scheduled reviews of facilities and fixed assets and fund priority and preventive maintenance, annually, through their maintenance and operations budgets.

Since Facility & Grounds Maintenance uses the SchoolDude Maintenance Direct system, the department can enter preventative maintenance work orders in the system and run reports in Maintenance Direct, filtering the purpose code of preventative maintenance. The equipment report module allows users to select “Summary Report- Maintenance Costs versus Preventive Maintenance Costs” and the report will segregate the reactive maintenance and preventative maintenance costs for the School Systems equipment.

**RECOMMENDATION 6-G.1**

**Enhance the School System’s preventative maintenance program by developing and implementing a formal, documented preventative and predictive program containing regularly scheduled maintenance and repair activities.**

Facility & Grounds Maintenance management should enhance the School System’s preventative maintenance program to include documenting and implementing a comprehensive, detailed preventive maintenance schedule for all maintenance projects in the School System—and prioritize these projects

by school, and administrative support facility, for both facilities and equipment. A timeline for completing preventive maintenance projects should also be established.

In addition, the capabilities within the SchoolDude work order system should be understood and implemented to schedule and report on the status of the preventative and predictive maintenance programs.

After developing the preventative and predictive maintenance programs, the School System should adequately fund its preventative maintenance budget to address the scheduled preventative maintenance activities at targeted facilities.

### **FISCAL IMPACT**

The development of the preventative and predictive maintenance programs can be completed with existing resources.

### **OBSERVATION 6-H**

**The Facility & Grounds Maintenance Department has compiled a detailed summary listing of its potential deferred maintenance projects, but has not developed a formal deferred maintenance plan.**

The Facility & Grounds Maintenance Department currently summarizes its proposed deferred maintenance projects in a Microsoft Excel spreadsheet that it uses to present its annual funded projects related to the School System's 2012–2018 Capital Improvement Budget. The spreadsheet named "Capital Improvement Budget", in its present form, does not include assumptions the department used to determine deferred maintenance needs, the year that maintenance should be performed, and related authorization of deferred maintenance projects.

The Capital Budget is made up of a six-year list of projects approved annually by the Board of Education. With board approval, the School System submits the Capital Budget to the mayor and Metropolitan Nashville Government director of finance who review the budget along with capital budgets from all other Metropolitan Nashville Government departments, make changes, and submit a full capital spending proposal to the Metropolitan Nashville Council for funding approval. Depending on the city's bonding capacity and specific needs, Metropolitan Nashville Council may not appropriate all the capital funds the School System requests. Accordingly, the appropriation approved by Metropolitan Nashville Council may be less than the dollars needed to completely fund the School System's Capital Budget. For example, Metropolitan Nashville Public Schools did not receive capital budget funds (which include the deferred maintenance budget) for 2011-2012. If an allocation is given, projects listed within the Capital Budget are prioritized funded. School System management reported that often Metropolitan Nashville Government does not provide sufficient funding to support critical needs such as the deferred maintenance program.

Although the School System's capital improvement budget for 2012-2013 included \$3,000,000 for "miscellaneous deferred maintenance projects," The Facilities & Grounds Department did not provide a list of specific deferred maintenance projects. Additionally, capital improvement budgets provided for 2010-2011 and 2013-2014 did not include a specific category for deferred maintenance projects.

Deferred maintenance is maintenance that was not performed when it should have been or was scheduled to be, and was delayed to a future period. Such situations generally arise because of shortages of funds, personnel, or specific management practices. Some educational institutions require inspection programs and systems to identify and track deferred maintenance and capital renewal needs. The purpose of a facility audit and inspection program is to identify, quantify (provide budget estimates), and prioritize deferred maintenance projects and capital renewal and replacement projects, according to the urgency of need and significance to the institution's mission.

Duval County Public Schools (Jacksonville, Florida) manages deferred maintenance using a living maintenance backlog and tracking system. Shelby County Schools (Memphis, Tennessee) maintains a 10-year maintenance plan including deferred maintenance and partially based on repeat work orders. The following process is implemented by the University of California to document deferred maintenance needs and budget.

### 1. Facility Audit and Inspection

Maintenance departments physically inspect facilities to identify deferred maintenance and capital renewal needs and/or projects.

### 2. Prioritization

Identified projects are prioritized based on the following criteria:

**Priority 1: Currently Critical.** These are needs and/or projects which significantly impact the mission of the institution and require immediate action to return a facility to normal operation, stop accelerated deterioration, or correct a cited safety hazard—especially those conditions that potentially impact an entire campus, or pose a significant risk to health and safety. Examples of such conditions would include the following:

- *campus impact: A Campus-wide chilled water system is in imminent danger of failing. Failure would make all buildings non-functional, essentially negatively impacting the entire campus.*
- *health and Safety Impact: Previously undiscovered dry rot has compromised structural beams. The building cannot be safely occupied without immediate repair.*

**Priority 2: Potentially Critical.** These are needs and/or projects that will become critical within a year if not corrected expeditiously. Situations in this category include intermittent interruptions, rapid deterioration, and potential safety hazards. The significance of these conditions to the mission of the institution should be a factor.

**Priority 3: Necessary, Not Yet Critical.** These are needs and/or projects that include conditions requiring reasonably prompt attention to preclude predictable deterioration or potential downtime, and the associated damage or higher costs, if deferred further. Conditions not significantly impacting the mission of the institution should be placed in this category.

### 3. Further Project Categorization

Upon completing the two-step Facility Audit and Inspection Program procedure, categorize projects as deferred maintenance or capital renewal and replacement.

### 4. Deferred Maintenance Projects

As a general rule, the scope of deferred maintenance projects should be limited to a specific work item, or set of integrally-related work items, in a:

1. single building or group of buildings.
2. clearly identifiable component of a grounds area.
3. utilities system.

The project should be accomplished under a single contract or work order.

For administrative simplification, no deferred maintenance project should be smaller than \$5,000. Projects under \$5,000 should be funded from regular maintenance funds. For planning, budgeting, and implementing purposes, similar work items of small value may be aggregated to make a reasonably-sized project, if the items are of equal priority and if they are intended to be accomplished within the fiscal year. Major work items, however, in individual buildings—separately identifiable grounds areas, or utilities systems—are considered separate projects and are not to be aggregated.

#### RECOMMENDATION 6-H.1

##### **Develop and maintain a formal deferred maintenance plan.**

The Facility & Grounds Maintenance Department should inspect, track, prioritize, and estimate the cost of deferred maintenance projects annually. As funding becomes available, the School System's chief financial officer should issue instructions for submitting a prioritized list of deferred maintenance projects for completion in a given year.

#### FISCAL IMPACT

Development of the deferred maintenance plan can be done with existing resources.

#### OBSERVATION 6-I

##### **The Facility & Grounds Maintenance Department lacks a comprehensive training plan.**

Each division in the department has a different set of skills in which employees are trained to perform their work. Facility & Grounds Maintenance staff indicated that additional training is needed for their specific trade skills and in the use of technology. Some training is mandatory for certifications, such as those required for lead-based paint assessment and abatement, locksmiths, heating, ventilation and air conditioning systems, and boiler safety and service.

Training recommendations from the Facility & Grounds Maintenance staff included the following:

- radon training to enhance understanding of factors that affect radon levels in buildings. Local government ordinances regulate the tolerance levels in all classrooms;
- proxy lock training, as these locks are becoming more widely used at campuses;
- use of SchoolDude Maintenance Direct work order system and work order categories to provide more accurate accounting of the type of work performed, and other software applications including AutoCAD, Excel, and Word. Improved communication devices such as wireless access in the maintenance operations building is needed to support the use of technology;
- increased cross-training as the employee buy-out retirement program will result in the loss of key personnel and skills; and
- periodic training in trade skills and equipment and safety practices.

**Exhibit 6-40** presents the training hours and types of training reported by peer school districts for 2012-2013.

**Exhibit 6-40  
Peer Schools Training Program 2012-2013**

Survey Question	Metropolitan Nashville Public Schools	Atlanta Public Schools	Duval County Public Schools	School Board of Polk County	Shelby County Schools
<b>MAINTENANCE</b>					
Average training hours	No response	20 hours	11 hours or 3,444 total man hours	0	10 hours
Type of training	No response	Electrical, plumbing, carpentry, ladder safety, building audits, paint preparation and application, asbestos	Craft specific DVDs, PowerPoint presentations for specific classes with testing materials	Not applicable	Product training
<b>GROUNDS</b>					
Average training hours	No response	20 hours	12 hours or 396 total man hours	8 hours	15 hours
Type of training	No response	Chainsaw safety, lift safety, district policy	Craft specific DVDs, PowerPoint presentations for specific classes with testing materials	No response	Product training, SOP training

Source: McConnell Jones Lanier & Murphy LLP Peer Survey, June 2014.

Appropriate training could greatly improve the department’s automation and operating efficiency. Adequate training ensures that School System employees understand the scope of their responsibilities and performance expectations, and serves to update skills and knowledge necessary for employees to effectively and efficiently perform their duties.

Appropriate training must address maintenance, specialized trades, grounds keeping, and be tailored to meet the needs of the specific function. In addition, training in maintenance-related activities such as operating procedures, use of tools, proper lifting techniques, workplace safety, hazardous materials handling, and emergency procedures is a necessity for all employees. A district can use a variety of



training sources—including vendors and manufacturers of their supplies and equipment, contract trainers, and professional association meetings.

#### **RECOMMENDATION 6-I.1**

##### **Perform a training needs assessment and develop an annual training plan to improve the overall skills and efficiency of Facility & Grounds Maintenance staff.**

Based on the training needs assessment, Facility & Grounds Maintenance management should explore a combination of in-house and external training programs that provide information on topical areas such as new techniques related to operating procedures for equipment for crafts and grounds personnel. Administrative staff should seek training for data management and effective management report preparation. In-house or external training programs should be evaluated for consideration, based on cost and training content. The concept of training a small number of employees and requiring them to share information with other departmental staff should also be considered. An evaluation component should be included in all training so that employee feedback can be used to improve future training.

Copies of training records should be retained as documentation by the department. The Facility & Grounds Maintenance Department should maintain copies of the attendance sheets for in-house training with all of the participant's signatures. Participation in outside training events should be documented through either certificate of completion or attendance sheets.

#### **FISCAL IMPACT**

The training assessment can be completed with existing resources. The cost of training cannot be determined until the training plan is completed.

### **ENERGY MANAGEMENT**

#### **OBSERVATION 6-J**

**The School System has neither a comprehensive energy management program to effectively plan energy use, nor does it have an in-house energy manager to coordinate energy management programs and continuously evaluate energy use to reduce energy costs.**

The Facility Planning & Construction Department is responsible for implementing the latest energy saving technologies for new schools, including energy management systems; energy efficient heating ventilation and air conditioning equipment; various wall and roof insulation materials and techniques; geothermal heat pump systems; and Leadership in Energy & Environmental Design Building Certification. Moreover, the Heating Ventilation and Air Conditioning trade area of the Facility & Grounds Maintenance Department is responsible for applying basic engineering fundamentals to heating, ventilation, and air conditioning systems to maintain the School System's buildings and facilities at their most energy efficient levels.

In the absence of a dedicated energy manager to oversee the School System’s energy management function, the School System has implemented two important energy initiatives. One initiative involves participation in a Demand Shedding Program sponsored by the Tennessee Valley Authority. The agency pays a fee based on how much the participant’s energy use is reduced when requested to lessen their use. This program is provided at no cost to the School System because the Tennessee Valley Authority installs all of the equipment in schools at its own expense. The second initiative involves the School System executing a five-year contract with Facility Services, Inc., in January 2010, to provide commissioning, utilities management, energy conservation projects, and energy management operating systems. The contract is set to expire in January 2015. According to the proposed scope of services from the proposal included in the contract, the company is to *“continually work to reduce energy and fuel consumption of the School System’s facilities through management of utilities, energy conservation projects, and verifying the design of energy efficient systems.”*

**Exhibit 6-41** summarizes the specific services that the contractor, Inc. proposed to provide to the School System.

**Exhibit 6-41  
Facility Services, Inc. Energy Management Contract Summary of  
Contracted Energy Management Services**

Category	Specific Services Per Contract	Services Provided
<b>Utilities</b>	<ul style="list-style-type: none"> <li>• Manage all utilities, including electricity, gas, and water.</li> <li>• Review, select, implement, and maintain an energy management tracking software computer program for billing, measurement, and trending of utilities.</li> </ul>	No
<b>Energy Conservation Projects</b>	<ul style="list-style-type: none"> <li>• Provide oversight and coordination of ongoing energy-related projects. Work with the director of Facility &amp; Grounds Maintenance, personnel, and current Energy Service Company in evaluating and implementing energy conservation projects, improving the efficiency of existing equipment, and properly maintaining facilities to better manage energy and reduce consumption.</li> <li>• Along with the Energy Service Company, assist in the development and review of technical data, estimates, and applications for financial assistance with energy construction projects.</li> </ul>	No
<b>Planning and Construction</b>	<ul style="list-style-type: none"> <li>• Work directly with the Facility Planning &amp; Construction Department to coordinate and administer contract documents for energy-related renovations and new construction to ensure that the contract documents provide for optimal energy consumption.</li> <li>• Coordinate plans and specifications and/or verify the design of energy efficient systems for buildings.</li> <li>• Coordinate with outside designers involved in all projects with a potential to save energy.</li> <li>• Coordinate and work with School System project managers and contractors involved in energy-related projects.</li> </ul>	Yes
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Provide building commissioning services for new construction, retro-commissioning for remodeled or existing facilities, and specific equipment or component commissioning as directed by the director of Facility Planning &amp; Construction.</li> </ul>	Yes

**Exhibit 6-41  
Facility Services, Inc. Energy Management Contract Summary of  
Contracted Energy Management Services**

Category	Specific Services Per Contract	Services Provided
<b>Operations</b>	<ul style="list-style-type: none"> <li>Oversee the planning, implementation, operation, and maintenance of a global Energy Management Control System involving networking of devices in various buildings to an operations command center.</li> <li>Coordinate work responsibilities, assignments, and communications with Facility &amp; Grounds Maintenance Departments and with other managers, administrators, and professionals related to facilities.</li> <li>Ensure continued energy conservation measures by coordinating periodic odd-hour inspections, and by monitoring the Energy Management Control System as needed to verify continued functions and controls.</li> <li>Assist director of Facility &amp; Grounds Maintenance as necessary to troubleshoot HVAC operation and measurement issues. Assist in evaluating complaints for various items including, but not limited to space comfort and indoor air quality.</li> <li>Provide training of school personnel and maintenance, and manages staff, as appropriate, to ensure the efficient operation of school facilities</li> </ul>	No
Category	Specific Services Per Contract	Services Provided
<b>Communications</b>	<ul style="list-style-type: none"> <li>Solicit the involvement of faculty, staff, and students in the “energy conservation process.”</li> <li>Develop and publish an Energy Management Newsletter as necessary to report and educate about energy issues.</li> <li>Stay informed of changing laws, codes, and other pertinent information that would have an effect on the energy use and fuel-run systems through publications and seminars.</li> <li>Develop and submit periodic reports regarding energy conservation efforts and results to the School System’s administration and the Board of Trustees as required.</li> </ul>	No

Source: Metropolitan Nashville Public Schools, Facility Services, Inc. Energy Management Contract, executed January 26, 2010.

Despite the existing division of responsibility for energy planning for new facilities and energy management for existing and new facilities, and the existing energy management contract with Facility Services, Inc., the School System has no comprehensive energy management plan or central point of accountability to effectively plan, manage, regulate, and monitor energy use in its facilities.

**Exhibit 6-42** presents the School System’s actual net energy costs for 2011-2012, 2012-2013, and 2013-2014 and shows that total energy costs have risen a cumulative 8 percent over the past three fiscal years. Several factors could have contributed to this increase such as temperature differences, energy demand increases, and the addition of 200,000 square feet in new facilities. However, the bottom line is that the School System does not actively monitor energy usage, which is one of the most critical factors in implementing an energy management plan and controlling costs.

**Exhibit 6-42  
Metropolitan Nashville Public Schools  
Energy Costs**

Utility	2011–2012	2012–2013	2013–2014
Electricity	\$18,331,916	\$18,590,757	\$19,476,359
Natural Gas	\$2,339,330	\$2,527,456	\$3,091,750
Water & Sewer	\$3,113,353	\$3,091,922	\$3,029,220
<b>Total</b>	<b>\$23,784,599</b>	<b>\$24,210,135</b>	<b>\$25,597,329</b>
<b>Percent Increase 2011-2012 through 2013-2014</b>			<b>8%</b>

Source: Metropolitan Nashville Public Schools, Financial Reporting & Budget Department, August 2014.

In addition to rising energy costs, the School System also has different building automation systems monitoring energy consumption throughout its schools and administrative facilities, which is further evidence of the absence of comprehensive energy management program or central point of accountability for energy management. For example, the School System has 96 sites with four separate building automation systems for energy management. Two energy management specialists in the heating, ventilation, and air conditioning (HVAC) trade area maintain these four disparate energy management systems. **Exhibit 6-43** presents a summary of the four energy management systems and the corresponding number of facilities the systems monitor.

**Exhibit 6-43  
Metropolitan Nashville Public Schools  
Current Energy Management and Monitoring Systems**

Energy Management and Monitoring System	Description/Capabilities/Comments	Number of Facilities (Sites)
System 1	Antiquated system that is over 25 years old and 90 percent of the systems provide only monitoring rather than energy management functionality. System cannot schedule energy-saving events, set-back temperatures, or provide usage trends for analysis. The School System is replacing these systems in-house with capital improvement funds at a rate of five to seven systems per year.	31
System 2	Basic building automation system that can monitor, schedule, set points, set-back temperatures, usage trends, reporting, and alarm. Programming is not user-friendly and the system has hardware issues from time-to-time	13
System 3	Extensive building automation system monitoring and scheduling. System can change all set points, set-back temperatures, monitor trending, reporting, and alarm. Programming is user friendly, and can easily manage trouble shooting and diagnostics at the server or on site.	28
System 4	Basic building automation system that can monitor, schedule, set points, set-back temperatures, usage trends, reporting, and alarm. Programming is not user-friendly. Server routinely crashes and department needs to replace server hardware.	24
<b>Total Sites</b>		<b>96</b>

Source: Metropolitan Nashville Public Schools, Facility & Grounds Maintenance Department Interviews and E-mail Communication, February 2014.

**Exhibit 6-43** further shows differences in functionality and capabilities of the existing energy management system. These disparities in functionality, features, and programming illustrate the need for a strategic, coordinated energy management program with centralized oversight by a capable energy manager.

Energy costs across the nation have greatly increased over the last several years to levels that require close monitoring and management. Energy management is a vital tool to ensure the cost-effective operation of utilities in the School System's schools and administrative facilities. Energy audits and other sources of data are essential to controlling costs. Management uses data gathered from energy audits to determine priorities, and to evaluate the success of a program. While the purpose of an energy management program is to minimize waste, the program should also ensure comfort in occupied spaces and encourage energy awareness across the district.

An energy manager plans, regulates, and monitors energy use in an organization or facility. They aim to improve energy efficiency by evaluating energy use and by implementing new policies and changes as necessary.

#### **RECOMMENDATION 6-J.1**

**Hire an in-house energy manager to provide a central point of oversight and accountability to control energy costs.**

The School System should hire a seasoned energy manager to oversee the system's energy management program and provide a central point of accountability for developing a comprehensive energy conservation program, reducing energy costs over the long-term. The energy manager should report to the director of Facility Planning & Construction and have the following responsibilities, which include:

- develop a comprehensive energy management program, and regulate and monitor energy use in schools and facilities, including implementing one efficient building automation system for all facilities;
- improve energy efficiency by evaluating energy use and implementing new energy management policies and changes where necessary; and
- coordinate all aspects of energy management, including energy efficiency, waste management, energy audits, building operating procedures, and guidelines for conserving energy, and energy conservation awareness.

#### **FISCAL IMPACT**

The implementation of this recommendation will require the School System to invest in an energy manager. Beginning in 2014-2015, the School System will incur a partial annual salary cost for an energy manager. According to Salary.com, the median annual salary for an energy manager in the Nashville, Tennessee market is \$91,196 before fringe benefits. Assuming the School System hires the energy manager with an April 1, 2015 start date, the investment in 2014-2015 will be \$22,799, representing 25

percent of the energy manager's annual salary. Beginning in 2015-2016, the annual investment will be \$91,196, representing a full year's salary.

### **RECOMMENDATION 6-J.2**

#### **Develop and implement a comprehensive energy management program.**

Once the School System hires the energy manager, the Facility Planning & Construction Department— in collaboration with the Facility & Grounds Maintenance Department—should develop, document, circulate, and implement a comprehensive energy management program that includes a written energy conservation plan.

One of the first and most important steps in developing a comprehensive energy management program is implementing the industry-recognized best practice of conducting periodic energy audits. Annual energy audits detect energy usage patterns and identify areas of possible energy inefficiency. The energy manager should work with the director of Facility Planning & Construction, and the director of Facility & Grounds Maintenance Department, to identify a single building automation system to capture, analyze, and monitor energy usage and cost data by location, and audit this information annually. The annual audits will allow the School System to target specific schools and other facilities for more intensive monitoring based on unusual spikes.

A comprehensive energy management program contains the following features which include:

- a written energy conservation and management plan with short-term and long-term energy conservation goals;
- a management staff person assigned to review the utility bills monthly using a customized spreadsheet or database that functions as a database for storing monthly bills and energy usage (It is helpful for the data to have visual aids such as graphs that automatically update when entering new data.);
- an annual energy audit to monitor and track energy usage by school or administrative facility, targeting those facilities with higher than average energy use statistics;
- comprehensive energy equipment audits every five years to ensure that heating, ventilation, air conditioning, and lighting retrofits are up to date and energy efficient; and
- collaboration with utility providers, government agencies, and local industry experts to identify energy efficient benchmarks and implement strategies to increase cost-efficiency.

### **FISCAL IMPACT**

When the School System conducts an energy audit, the potential savings can be determined. A conservative projection is 5 percent savings annually of electricity costs or \$973,818 (\$19,476,359 electricity costs times 5 percent) beginning in 2015-2016.

## ALTERNATIVE SOURCING AND LEVERAGING OPPORTUNITIES

### **LEVERAGING METROPOLITAN NASHVILLE GOVERNMENT**

The review team explored whether there would be a strategic advantage to leveraging maintenance resources provided by the Metropolitan Nashville Government Building Operations Department within the City's General Services Division and the School System. Strategically leveraging resources is also known as a shared services model. Shared services models can exist between two or more entities whereby one of the entities will provide a service or combine services to reduce cost for both entities.

Three factors were considered when evaluating the feasibility of implementing a shared services maintenance model between Metropolitan Nashville Government Building Operations Department and the School System. These factors were the feasibility of (1) consolidating executive leadership of the two departments; (2) planning; and (3) executing day-to-day maintenance operations.

The review team believes that it is possible to consolidate the executive leadership (director-level position) of Metropolitan Nashville Government Building Operations Department and the School System's Facility & Grounds Maintenance Department and structure an appropriate span of control for direct reports and line-level staff such as trade employees so that they have adequate supervision and quality oversight. The executive leadership position, with the appropriate facilities background could also oversee and implement the planning functions for both the Metropolitan Nashville Government Building Operations Department and the School System, even though the major focuses of the two departments are different.

The major difficulty in executing an efficient and cost-effective shared services model for the two departments would arise in the integration of two different computerized maintenance work order management systems, which are critical to executing day-to-day operation and restructuring trade staff crews to accommodate both departments. The Metropolitan Nashville Government Building Operations Department has implemented the BOSS Solutions maintenance work order management system. This system is designed mainly for commercial building use. The School System has invested considerable resources and time in the implementation of the SchoolDude Maintenance Direct work order system, which was designed exclusively for the needs of facilities maintenance, information technology, and energy needs for educational institutions. The amount of time, effort, and resources required to identify and implement compatible work maintenance management systems and reorganize maintenance trade staff would likely outweigh the benefits of shared services. This conclusion is also evidenced by the fact that major outsourcing entities that specialize in facilities privatization, implement distinctly separate business units for management of commercial type buildings and educational facilities.

## **PRIVATIZATION/OUTSOURCING POSSIBILITIES**

The review team also explored the feasibility of outsourcing additional functions within the School System’s Facility & Grounds Maintenance Department to further reduce operating costs. As noted in Accomplishment 1-A, the School System successfully outsourced custodial and grounds keeping services to GCA Services Group and Landscape Services, Inc., respectively, in May 2010. Private companies often provide contracted facility management services to manage facilities support functions to reduce operating costs, increase productivity, and improve the quality of service.

Since the School System has already outsourced custodial and grounds keeping services, our analysis focuses on the potential opportunity to outsource maintenance and energy management services—especially since our observations in this chapter indicate challenges within the existing maintenance functions which include:

- the absence of a comprehensive preventative maintenance program and an accompanying preventive maintenance schedule for each building to address ongoing school maintenance issues;
- the absence of a comprehensive energy management program and in-house energy manager to provide a central point of oversight and accountability for reducing energy costs;
- the inability of the Facility & Grounds Maintenance Department to maximize the use of its automated work order system to improve responsiveness and attendant service levels; and
- the absence of a comprehensive training plan to ensure the department has a crew of highly skilled, well-trained maintenance personnel.

At the review team’s request, one national facilities management outsource provider analyzed the School System’s facility maintenance and two national facilities management outsource providers analyzed the energy management operations based on specific criteria, and related data to identify cost-savings opportunities—if they were to become the outsourced facilities maintenance management company. We provided the national companies with a “Confidential Response to Information Request,” for each to use in developing cost estimates to provide comprehensive facilities maintenance services to the School System. The information request included the following:

- current scope of work of the maintenance organization within the Facility & Grounds Maintenance Department;
- copies of the current Facility & Grounds Maintenance Department’s budget, including separate budgets for maintenance and supplies expenditures;
- detailed break-out of maintenance program costs, including identifying professional services purchased;
- list of the age of each school and location;
- gross square footage of school buildings;
- number of employees and number of hours employees work annually, including full-time and part-time employees;



- number of paid non-work days such as holidays, vacation, and sick time;
- unionization of employees;
- annual expenditures for electricity, gas, and water;
- description of the department’s Computerized Maintenance Management System and related work order statistics for 2012-2013;
- fleet costs; and
- construction supervision.

From this baseline information, the national facilities management outsource providers analyzed the Facility & Grounds Maintenance Department’s financial structure and budget to develop total maintenance and energy costs per square foot for the department. The maintenance cost per square foot included both supply and labor costs, which the outsource provider compared to industry benchmarks to develop its cost estimates. The energy cost per square foot included electricity, water and sewage, and natural gas costs.

**Exhibit 6-44** presents a summary of both national facilities management outsource providers’ feasibility studies to provide outsourced services to the School System.

**Exhibit 6-44  
Summary of National Facilities Management Outsource Providers’  
Feasibility Studies to Outsource Maintenance Management**

Category	Provider “A”	Provider “B”
<b>Information Reviewed and Analyzed</b>	<ul style="list-style-type: none"> <li>• Enrollment</li> <li>• Square footage</li> <li>• Labor hours and cost</li> <li>• Productivity</li> <li>• Cost structure</li> <li>• Work order statistics</li> <li>• Utility budget</li> </ul>	<ul style="list-style-type: none"> <li>• Gross Square Footage of school buildings</li> <li>• Current budget</li> <li>• Facility inventory and age</li> <li>• Computerized Maintenance Management System (name of system)</li> <li>• Annual spend on gas, electricity, and water</li> </ul>
<b>Information not Reviewed and Analyzed</b>	<ul style="list-style-type: none"> <li>• Building layout and structures</li> <li>• Major mechanical systems and condition</li> <li>• Building loads</li> <li>• Technology systems</li> <li>• Training and development of staff</li> <li>• Health and safety standards</li> <li>• Building administration issues and concerns</li> </ul>	

**Exhibit 6-44  
Summary of National Facilities Management Outsource Providers’  
Feasibility Studies to Outsource Maintenance Management (Cont’d)**

Category	Provider “A”	Provider “B”
<b>Baseline Information</b>	<ul style="list-style-type: none"> <li>• Average Daily Attendance: 74,035</li> <li>• Gross Square Footage: 14,154,857</li> <li>• Days of Operation Planned: 175</li> <li>• Number of Structures: 160</li> <li>• Program Budget: \$18,636,000</li> <li>• Cost per Square Foot: \$1.32</li> <li>• Supply Cost per Square Foot: \$0.39 [29 percent]</li> <li>• Labor Cost per Square Foot: \$0.85 [64 percent]</li> <li>• Total Full-Time Equivalents: 204</li> <li>• Productivity per Full Time Equivalent: 66,422</li> <li>• Energy Cost per Square Foot based on 2013-2014 budgeted electricity and natural gas cost totaling \$27,130,900: \$1.92</li> </ul>	<ul style="list-style-type: none"> <li>• Gross Square Footage: 14,154,857</li> <li>• Days of Operation Planned: 248 [52 weeks x 5 days per week – 12 holidays]</li> <li>• Number of Structures: 160</li> </ul>
<b>Findings</b>	<ul style="list-style-type: none"> <li>• Supply costs are three percent lower than private sector benchmarks.</li> <li>• Labor costs are eight percent – 37 percent above benchmark standards.</li> <li>• The number of fleet vehicles may be in line with benchmarks, but the department does not appear to bear the total cost of the fleet</li> <li>• Total maintenance cost per square foot exceeds Provider A’s benchmarks by \$0.23 per square foot when compared to the low range; and is \$0.12 per square foot less than the benchmark when compared to the high range.</li> <li>• Energy cost per square foot is \$0.34 to \$0.59 per square foot higher than Provider A’s national benchmark standards for its outsourced energy management programs.</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Cost per square foot is 15-20 percent higher than Provider B’s national benchmark standards for average annual energy cost per square foot for its outsourced energy management programs.</li> </ul>

*Source: Confidential Maintenance Feasibility Studies provided by two national facilities outsource providers at McConnell Jones Lanier & Murphy LLP’s request, July 2014.*

**Exhibit 6-44** shows that Provider A based its cost estimate on findings which determined that the Facility & Grounds Maintenance Department exceeded benchmark standards in the facilities management industry established for labor costs per square foot and total maintenance cost per square foot. Providers A and B estimated that the School System’s energy cost per square foot exceeded the average annual energy cost per square foot for organizations that contracted their energy management programs to them as an outsourced energy management solution.

While both Providers A and B focused their analysis on discrete components of the baseline information they requested, they clearly indicated in their responses that their cost estimates are based on their

review and analysis of information the review team provided. Accordingly, neither conducted a formal site visit to review building layouts, condition of buildings, technology systems, or staffing patterns, etc. As a result, the cost estimates provided represent an opportunity to reduce the School System’s maintenance operating and energy costs through an outsourcing solution that must be the result of a comprehensive request for proposals process. **Exhibit 6-45** compares the range of estimated cost-savings opportunities based on both providers’ low and high levels, which compared the Facility & Grounds Maintenance Department’s current financial and productivity levels to industry benchmarks.

**Exhibit 6-45**  
**Estimated Cost Savings Opportunity to Outsource Maintenance Management and Energy Management to a National Facilities Management Outsource Provider**

Variable	Outsource Provider A		Outsource Provider B	
	Low Range Cost Savings Estimate	High Range Cost Savings Estimate	Low Range Cost Savings Estimate	High Range Cost Savings Estimate
School System’s total maintenance cost per square foot	\$1.32	\$1.32		
Estimated outsourced cost per square foot	\$1.35	\$1.05		
Estimated savings per square foot	(\$0.03)	\$0.27		
Gross Square Footage *	14,154,857	14,154,857		
<b>Estimated annual savings (cost) for maintenance management</b>	<b>(\$424,646)</b>	<b>\$3,821,811</b>		
<hr/>				
School System’s energy costs per square foot for electricity and natural gas	\$1.92	\$1.92	\$1.92	\$1.92
Estimated outsourced energy cost per square foot	\$1.60	\$1.35	\$1.63	\$1.54
Estimated savings per square foot	\$0.32	\$0.57	\$0.29	\$0.38
Gross Square Footage *	14,154,857	14,154,857	14,154,857	14,154,857
<b>Estimated annual savings for energy management</b>	<b>\$4,529,554</b>	<b>\$8,068,268</b>	<b>\$4,104,909</b>	<b>\$5,378,846</b>

Source: Confidential Maintenance Feasibility Studies provided by two national facilities outsource providers at McConnell Jones Lanier & Murphy LLP’s request, July 2014.

**Exhibit 6-45** shows that the School System has an opportunity to potentially realize annual savings of up to as much as \$3,900,000 by outsourcing its maintenance operations, and \$2,400,000 to \$8,300,000 by outsourcing its energy management program through a competitive request for proposals process. Although the range of projected annual savings is significant, one provider noted, that due to the complexity of the Facility & Grounds Maintenance Department—because of its size and scale—numerous factors would impact the financial considerations of proposals submitted by potential vendors. These factors will include decisions related to staffing and personnel, energy and utility costs, and allocated or non-allocated costs—such as general liability insurance and Workers’ Compensation, employment costs (uniforms, background checks, and training), technology (hand-held devices, computers, and telephones), Human Resources and Finance Department support. In any event, the projected annual savings would likely fall within this range once the School System undertakes a competitive solicitation process.

The School System should proceed with a competitive request for proposal process to outsource its maintenance department and energy management program to a national facility management outsource provider for 2015-2016.

**FISCAL IMPACT**

The midpoint of Provider A’s projected annual savings estimate for outsourced maintenance management is \$1,698,582 [(-\$424,646 + \$3,821,811) ÷ 2]. Accordingly, the conservative approach to estimating the potential annual cost savings to the School System for outsourced maintenance management is to use the midpoint, which yields a projected annual savings of \$1,698,582 beginning in 2016-2017.

The midpoint of Provider A’s projected annual savings estimate for an outsourced energy management program is \$6,298,911 [(\$4,529,554 + \$8,068,268) ÷ 2], while the midpoint of Provider B’s projected annual savings estimate is \$4,741,878 [(\$4,104,909 + \$5,378,846) ÷ 2]. Accordingly, the conservative approach to estimating the potential annual cost-savings to the School System for an outsourced energy management program is to average both midpoints, which yields a projected annual savings of \$5,520,395 [(\$6,298,911 + \$4,741,878) ÷ 2] beginning in 2016-2017.

The total potential annual cost savings opportunity from outsourcing the School System’s maintenance and energy management programs, beginning 2016-2017, is summarized as follows:

Projected annual savings from outsourcing maintenance	\$1,698,582
Projected annual savings from outsourcing energy management	\$5,520,395
Total projected annual savings from outsourcing opportunities	\$7,218,977

**FISCAL IMPACT SUMMARY**

	RECOMMENDATION	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
<b>CHAPTER 6: FACILITIES MANAGEMENT</b>								
<b>6-A.1</b>	Complete the planning components necessary to implement a fully-integrated 10-year Facilities Master Plan that addresses systemwide needs.	\$0	\$0	\$0	\$0	\$0	\$0	\$(200,000)
<b>6-B.1</b>	Develop and implement a process to conduct post-occupancy evaluations of major construction projects.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>6-C.1</b>	Optimize school facility utilization in all clusters as a component of the facility master planning process.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>6-D.1</b>	Develop an allocation model to determine the appropriate staffing levels for the Facility & Grounds Maintenance Department to enhance productivity levels in the most efficient, cost-effective manner.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>6-E.1</b>	Expand the geographic zone approach for deployment of trade staff for routine, preventative, and emergency maintenance needs.	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**FISCAL IMPACT SUMMARY (Cont'd)**

	RECOMMENDATION	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
6-F.1	Provide extensive training on the management reporting and analytical capabilities of the SchoolDude Maintenance Direct work order management system.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6-G.1	Enhance the School System's preventative maintenance program by developing and implementing a formal, documented preventative and predictive program containing regularly scheduled maintenance and repair activities.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6-H.1	Develop and maintain a deferred maintenance plan.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6-I.1	Perform a training needs assessment and develop an annual training plan to improve the overall skills and efficiency of Facility & Grounds Maintenance staff.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6-J.1	Hire an in-house energy manager to provide a central point of oversight and accountability to control energy costs.	\$(91,196)	\$(91,196)	\$(91,196)	\$(91,196)	\$(91,196)	\$(455,980)	\$0

**FISCAL IMPACT SUMMARY (Cont'd)**

	RECOMMENDATION	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
6-J.2	Develop and implement a comprehensive energy management program.	\$0	\$973,818	\$973,818	\$973,818	\$973,818	\$3,895,272	\$0
<b>TOTALS - CHAPTER 6 WITH IMPLEMENTATION OF REVIEW TEAM RECOMMENDATIONS</b>		<b>\$(91,196)</b>	<b>\$882,622</b>	<b>\$882,622</b>	<b>\$882,622</b>	<b>\$882,622</b>	<b>\$3,439,292</b>	<b>\$(200,000)</b>
<b>CHAPTER 6 OUTSOURCING IN YEAR TWO* – Proceed with a competitive request for proposal process to outsource its maintenance department and energy management program to a national facility management outsource provider for 2015-2016.</b>		<b>\$(91,196)</b>	<b>\$7,218,977</b>	<b>\$7,218,977</b>	<b>\$7,218,977</b>	<b>\$7,218,977</b>	<b>\$28,784,712</b>	<b>\$(200,000)</b>

## Management Response

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
Management of Metropolitan Nashville Public Schools should:			
6-A.1	Complete the planning components necessary to implement a fully-integrated 10-year Facilities Master Plan that addresses system-wide needs.	<p><b>Accept</b></p> <p>Facility Planning and Construction will work to develop and execute the missing components necessary to complete the 10-Year Facilities Master Plan. A major requirement is to include a community engagement plan in the process. The Communications Office is currently developing a complete communication engagement process with input from the Board.</p> <p>The existing process for interaction with the district’s Leadership and Learning Division will continue to be refined to capture future educational and program changes through revisions to the MNPS Educational Specifications. These changes will be reflected in the Facility Standard Space Guide and Design Guidelines.</p> <p>MNPS will also combine all aspects of the current and expanded evaluation and planning activities into a formal 10-year Master Plan Document. This document will include metrics to evaluate effectiveness of the plan and establish procedures for modifications required by receiving capital funding on a single year basis.</p> <p>As recommended, MNPS will seek to work with an educational planning consultant to assist in-house teams in developing the master plan. Funding for this effort is requested in the current Capital Improvement Budget.</p>	January 2016
6-B.1	Develop and implement a process to conduct post-occupancy evaluations of major construction projects.	<p><b>Accept</b></p> <p>Facility Planning and Construction is revising an existing post-occupancy evaluation form. The revised form will be deployed January 2015 for projects completed during the 2014-2015 school year. The evaluation forms will be provided to district administrative personnel, executive lead principals, principals,</p>	January 2015



## Management Response

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
		teachers, parents and community members, along with staff from Facility and Grounds Maintenance, custodians, Safety and Security and Technology.	
6-C.1	Optimize school facility utilization in all clusters as a component of the facility master planning process.	<b>Partially Accept</b> MNPS agrees in principle with the fiscal benefits of optimal facility utilization and strives to reach this goal where it is practical. However, the district considers facility use along with many other factors when determining the best way to serve the educational needs of all students. Recent and continuing spikes in Metro Nashville's population growth, as well as the expansion of the charter school initiative, have spurred significant student population shifts at a pace that has exceeded Metro Nashville's annual budgeting and related land-use and construction processes.	Ongoing
6-D.1	Develop an allocation model to determine the appropriate staffing levels for the Facility & Grounds Maintenance Department to enhance productivity levels in the most efficient, cost-effective manner.	<b>Accept</b> The MNPS Facility & Grounds Maintenance Department's staffing levels for maintenance/repairs are currently less than other organization recommendations, including the Florida Department of Education (Florida Center for Community Design & Research) referenced in the final performance audit report. MNPS will continue to monitor and compare with similar organizations.	April 2015
6-E.1	Expand the geographic zone approach for deployment of trade staff for routine, preventative, and emergency maintenance needs.	<b>Accept</b> Several Facility & Grounds Maintenance Department shops are already dispatched following a zone concept. MNPS will continue to expand the zone dispatch to all shops applicable to a zone concept to maximize efficiencies.	April 2015
6-F.1	Provide extensive training on the management reporting and analytical capabilities of the SchoolDude Maintenance Direct work order management system.	<b>Accept</b> MNPS has completed an extensive discussion with the manufacturer of the School Dude system concerning the available management reports. MNPS will continue to utilize SchoolDude data to improve the efficiency and effectiveness of the Facility &	April 2015

## Management Response

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
		Grounds Maintenance Department. Not all of the noted management reports are useful to the MNPS maintenance operations, but use of additional management reports will be expanded to identify work order and work management trends.	
6-G.1	Enhance the School System's preventative maintenance program by developing and implementing a formal, documented preventative and predictive program containing regularly scheduled maintenance and repair activities	<b>Accept</b> MNPS will develop and implement a documented preventative maintenance program for HVAC, plumbing, electrical, electronics and carpentry work centers.	Pilot HVAC PM implemented December 2014; All schools HVAC – October 2015
6-H.1	Develop and maintain a deferred maintenance plan.	<b>Accept</b> A deferred maintenance plan is in use as a worksheet of the Capital Improvement Budget process, but a formal deferred maintenance plan will be developed. The district has requested funding to outsource the development of a detailed Facility Condition Report. This detailed report will enhance the current process and provide additional documentation and justification for requests.	April 2015
6-I.1	Perform a training needs assessment and develop an annual training plan to improve the overall skills and efficiency of Facility & Grounds Maintenance staff.	<b>Accept</b> A comprehensive annual training plan will be developed by the Facility & Grounds Maintenance Department ensuring enhancement of safety practices, use of technology, and technical skill continuing education.	February 2015
6-J.1	Hire an in-house energy manager to provide a central point of oversight and accountability to control energy costs.	<b>Accept</b> The Facility & Grounds Maintenance Department will request funding and hire an in-house energy manager for oversight and accountability of energy costs.	September 2015
6-J.2	Develop and implement a comprehensive energy management program.	<b>Accept</b> The Facility & Grounds Maintenance Department will develop and implement a comprehensive energy management program and energy conservation plan.	April 2016

## Management Response

Chapter 6 - Alternative Sourcing Recommendation (page 6-68).		
<p>Proceed with a competitive request for proposal process to outsource the maintenance department and energy management program to a national facility management outsource provider for 2015-2016.</p>	<p><b>Reject</b> Existing staffing levels are less than the recommended levels by all maintenance standards. Current MNPS maintenance staffing is 1 FTE for 90,000 square feet. Florida Center for Community Design &amp; Research recommends 1 FTE for 45,000 square feet as referenced in the performance audit report. MNPS disagrees with the performance audit calculations for staffing and potential cost savings. Exhibit 6-44 and 6-45 references the Association of Higher Education. Association of Higher Education is a higher education association and recommended staffing levels are not comparable to required staffing for K-12 educational districts. MNPS will continue to monitor staffing levels and identify benchmark standards for comparable school districts to determine future staffing needs.</p> <p>MNPS rejects the recommendation to outsource the energy management program, but the school district plans to request funding to hire an MNPS energy manager for FY2015-2016. The MNPS energy manager will be responsible for development and implementation of a comprehensive energy management program that includes a written energy conservation plan. This corrective action plan aligns with Recommendation 6-J.2.</p>	<p>N/A</p>