

BEST PRACTICES FOR SCHOOL DISTRICT FACILITIES AND MAINTENANCE

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In the following report, Hanover Research outlines best practices in facilities and maintenance management in a school district. The report discusses efficient facilities maintenance, including a discussion of maintenance department staffing.



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EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

School maintenance has a measurable impact on student safety and learning.¹ School district maintenance and operations (M&O) departments are responsible for ensuring “clean and safe environments for children” as well as “creating a physical setting that is appropriate and adequate for learning.”² To support school districts in their efforts to maximize departmental efficacy and efficiency, this report discusses best practices for M&O management. These strategies aim to improve the safety and quality of the school learning environment while maintaining cost-efficiency. The report proceeds in two sections:

- **Section I: Efficient M&O Management** reviews general best practices for the efficient administration of a district M&O department. It discusses department budget allocations, planning, information management, and energy efficiency.
- **Section II: Staff Size and Roles** discusses optimal staffing allocations and best practices in managing staff and contractor work.

Below we present key findings from this research.

KEY FINDINGS

- **Several factors contribute to determining optimal M&O staffing, including district size, facility size, and number of facilities.** For example, in relation to facility size, some suggest that one adequately supplied custodian would be able to clean a maximum area of 31,000 sq. ft. at the level required to ensure the health and comfort of building users. The square footage under a single FTE custodian’s care must decrease in order for the level of cleanliness to increase.
- **M&O departments may increase staff efficiency by assigning their staff multiple responsibilities.** For instance, in addition to cleaning duties, custodial staff may take on maintenance or grounds responsibilities. We also find instances where custodians also serve as school bus drivers. Assigning multiple roles provides the district with added flexibility when assigning or repurposing employees.
- **Contracting external M&O services may be a way to reduce department costs.** Many districts have chosen to contract custodial services to an external company, finding this option cheaper than hiring additional full-time employees. During the decision-making process, M&O departments may consider the potential impact of the shift on current employees, as well as the time, money, and resources required to manage the contract.

¹ “Planning Guide for Maintenance of School Facilities.” U.S. Department of Education, February 2003. p. 8.
<https://nces.ed.gov/pubs2003/2003347.pdf>

² Ibid., p. xi.

- **A key component of efficient M&O management is the development and implementation of an effective maintenance master plan.** Carefully planning routine maintenance reduces the incidence of costly emergency repairs later on. Experts recommend that M&O departments conduct regular audits of district facilities. Information obtained in these audits can facilitate accurate maintenance and budget planning, as well as assist administrators in determining optimal staffing allocations.
- **Other strategies for increasing efficiency include employing a streamlined facilities management system and implementing an energy efficiency plan.** Experts suggest that districts occupying over 500,000 sq. ft. of facility space use a computerized maintenance management system (CMMS) to manage maintenance activities. In addition, setting goals for energy consumption especially in controllable costs (e.g., turning off electrical equipment when not in use, installing temperature sensors in facilities) may reduce costs and decrease adverse environmental impacts.

SECTION I: EFFICIENT M&O MANAGEMENT

In public school districts, the maintenance and operations (M&O) department is responsible for building maintenance, engineering, construction, and grounds care.³ Depending on the size and needs of the district, the department may have additional responsibilities as well, such as security. This section reviews general best practices for the efficient administration of a school district M&O department. It discusses department budget allocations, planning, information management, and energy efficiency.

BUDGET

Many factors impact precisely how an M&O department allocates its budget to different budget categories, including district size, the number of buildings in the district, the age of those facilities, and climate. Local labor costs and collective bargaining agreements impact staff salaries, and the cost of materials and supplies, as well as utility costs, are dependent on the local market.⁴ **Despite the variety of factors that influence budget allocations, districts typically dedicate the largest portions of their M&O budget to staff salaries, utilities, and equipment.**⁵

To provide further insight into the M&O budget allocations typical of public school districts, several organizations have benchmarked M&O costs across a variety of public school districts. For 38 years, *American School and University* (ASU) magazine produced an annual report presenting nationwide trends in M&O budget allocations for districts across the country. The most recent data available is for the 2008-09 school year, presented in Figure 1.1 on the following page.⁶

The ASU study presents a snapshot of the average M&O budget for an American school district. The study finds that nearly half of the typical M&O budget goes to staff salaries. Of that proportion, the largest cost is associated with custodial staff. Findings from this study further highlight the high proportion of an M&O budget that is spent on electricity, fuel, water, and other utility costs. Taken together, M&O costs comprise nearly 10 percent of total district expenditures.⁷

³ Earthman, G. and L. Lemasters. "School Maintenance and Renovation: Administrator Policies, Practices, and Economies." Proactive Publications, 2013, p. 15. Retrieved from Google Scholar.

⁴ "Managing for Results in America's Great City Schools." Council of the Great City Schools. pp. 105-107. <http://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/87/Managing%20for%20Results%202014.pdf>

⁵ Agron, J. "38th Annual Maintenance & Operations Cost Study: Schools." *American School and University*, April 2009. pp. 20-23. Retrieved from EBSCOHost.

⁶ *Ibid.*, pp. 20-23.

⁷ *Ibid.*, pp. 20-23.

Figure 1.1: American School and University M&O Costs Study, 2008-09

BUDGET ITEM	COST PER STUDENT	COST PER SQ. FT.	% TOTAL M&O BUDGET
Total Payroll	\$426.88	\$2.07	47%
Custodial	\$277.60	\$1.35	30%
Maintenance	\$118.31	\$0.57	13%
Grounds	\$30.97	\$0.15	3%
Outside Contract Labor	\$48.08	\$0.23	5%
Total Energy/Utilities	\$295.13	\$1.43	32%
Gas/Electricity/Other Fuels	\$244.87	\$1.19	27%
Utilities	\$37.82	\$0.18	4%
Trash Collection/Disposal	\$12.44	\$0.06	1%
Total Equipment and Supplies	\$67.03	\$0.33	7%
Custod./Maint. Equip. & Supplies	\$49.41	\$0.24	5%
Grounds Equip. & Supplies	\$17.62	\$0.09	2%
Other	\$73.08	\$0.36	8%
Total	\$910.20	\$4.42	100%

Source: *American School & University*⁸

Another cost study analysis on M&O was conducted by the Michigan School Business Officials (MSBO), a nonprofit corporation aimed at improving school leadership and management of business and operations.⁹ MSBO collects M&O financial and operations data for school districts in Michigan on an annual basis.¹⁰

The most recent MBSO report presents data from the 2012-13 school year as reported by 111 school districts in Michigan. Figure 1.2 on the next page presents relevant data from the MSBO survey for all Michigan districts surveyed, alongside a subset of districts with between 10,001 and 18,000 students (n = 8). The results of the MSBO study show that Michigan districts in this small subset pay more per square foot for staff salaries and utilities when compared to the average of all districts in the study. However, when compared to total district budgets, the M&O budget is a smaller share, compared to smaller school districts.¹¹

⁸ The report does not indicate sample size for these budget numbers. Agron, Op. Cit.

⁹ "About." Michigan School Business Officials. <http://www.msbo.org/about-msbo>

¹⁰ The MSBO study does not include data from the Michigan districts with more than 18,000 enrolled students (Detroit, Utica, Dearborn, and Plymouth-Canton). Moles, R. "MSBO Facilities Benchmarking Report." Michigan School Business Officials, February 2014, p. 15. http://msbo.org/sites/default/files/2014_facilities_benchmark.pdf

¹¹ Ibid., p. 9.

Figure 1.2: Michigan School Business Officials M&O Costs Study, 2012-13

BUDGET ITEM	ALL DISTRICTS* (n=111)	DISTRICTS WITH 10,001 – 18,000 STUDENTS* (n=8)
Custodial Salaries	\$0.73	\$1.13
Skilled Trades/Maintenance Salaries	\$0.18	\$0.28
Buildings and Grounds Salaries	\$1.10	\$1.45
Contracted Services	\$0.37	\$0.19
Utilities	\$1.11	\$1.24
Total Maintenance Expenditures	\$3.22	\$3.62
% of Total District Expenditures	6.32%	5.49%

Source: Michigan School Business Officials 12

* Measured in median dollars per square foot of instructional space.

The Council of the Great City Schools (CGCS) also conducts an annual Performance and Measurement Benchmarking project, which presents data on M&O finance and operations in the nation’s largest urban districts.¹³ CGCS has 67 member districts, all of which enroll 35,000 students or are located in the largest metropolitan area in their state.¹⁴

Over one half of the organization’s 67 member districts reported data for the most recent study, which covers the 2012-13 school year (see Figure 1.3). Large urban districts may benefit from economies of scale, but often have older facilities and higher personnel and supply costs. Districts included in the study report allocating anywhere from 6.7 to 14.1 percent of the budget to M&O costs, a large proportion of which is spent on custodial work.

Figure 1.3: Council of the Great City Schools M&O Costs Study, 2012-13

BUDGET ITEM	1 ST QUARTILE	MEDIAN	3 RD QUARTILE
Custodial Work (cost per sq. ft.)	\$1.47	\$1.82	\$2.17
Custodial Work (cost per student)	\$220	\$293	\$423
Custodial Supply (cost per sq. ft.)	\$0.08	\$0.11	\$0.14
Routine Maintenance (cost per sq. ft.)	\$0.85	\$1.06	\$1.48
Major Maintenance (cost per student)	\$23	\$48	\$154
Total M&O Cost (per student)	\$770	\$1,080	\$1,750
% of Total District Budget	6.7%	9.3%	14.1%

n=36-47

Source: Council of the Great City Schools¹⁵

¹² Ibid., pp. 9-14.

¹³ “Managing for Results in America’s Great City Schools,” Op. Cit., pp. 87-118.

¹⁴ “Fact Sheet.” Council of the Great City Schools. <http://www.cgcs.org/domain/24>

¹⁵ “Managing for Results in America’s Great City Schools,” Op. Cit., pp. 87-118.

MAINTENANCE PLANNING

Efficient maintenance of district facilities and equipment has a significant impact on the physical condition of facilities, the district budget, and student learning. Therefore, careful consideration should be devoted to developing a plan, monitoring system, and decision-making protocol to guide facilities maintenance. The following subsection discusses each of these considerations, in turn.

FACILITIES MAINTENANCE MASTER PLAN

A key component of an effective and efficient facilities and maintenance program is a well-designed M&O master plan. The U.S. Department of Education prepared an extensive planning guide for districts that are preparing their first M&O master plan or reviewing an existing plan.¹⁶ The planning guide notes that a master plan is an important tool for identifying and communicating needs and priorities. It asserts that “good plans include short- and long-term objectives, budgets, and timelines, all of which demonstrate organizational commitment to facilities maintenance.”¹⁷

The U.S. Department of Education underscores the importance of including all stakeholders – including maintenance and custodial staff, school administrators, parents, and community members, among others – in the facilities planning process.¹⁸ With a well-developed master plan in place, the district will be in a favorable position to make smart, if tough, decisions about facilities.¹⁹ Figure 1.4 presents an overview of the facilities maintenance plan development process, as advocated by the U.S. Department of Education.

Figure 1.4: Facilities Maintenance Plan Checklist

- ✓ Involve stakeholders in the planning process
- ✓ Identify needs (e.g., improving cleanliness and safety, correcting deficiencies, addressing deferred projects, increasing efficiency, decreasing utility bills)
- ✓ Establish priorities and targets
- ✓ Collect and use supporting data to inform decision-making
- ✓ Share the plan to garner support from management and key stakeholders
- ✓ Allocate funds to pay for planned activities
- ✓ Train staff to implement planned activities
- ✓ Implement the plan
- ✓ Be patient while awaiting cost savings or other results
- ✓ Evaluate the plan systematically
- ✓ Refine efforts based on evaluation findings
- ✓ Review and revise the plan periodically (e.g., every three years)

Source: U.S. Department of Education²⁰

¹⁶ “Planning Guide for Maintenance of School Facilities,” Op. Cit., p. 74.

¹⁷ Ibid., p. 13.

¹⁸ Ibid., p. 16.

¹⁹ Payton-Jones, K., Op. Cit., p. 14.

²⁰ Contents adapted from: “Planning Guide for Maintenance of School Facilities,” Op. Cit., p. 15.

FACILITIES AUDIT

An important component of the development and implementation of an M&O master plan is the facilities audit. A facilities audit is a “status check” of the inventory of buildings, grounds, and equipment in the school district. **A facilities director and district leaders use the baseline information from the audit to measure performance against the timelines outlined in the master plan and make necessary adjustments.** Figure 1.5 outlines recommendations from the U.S. Department of Education regarding which data to collect during a facilities audit.²¹

Figure 1.5: Components of a Facilities Audit

AREAS TO AUDIT	
Buildings	Grounds
<ul style="list-style-type: none"> Rooms Interior walls Interior doors Floors Plumbing Kitchens Hardware Egresses Communications equipment Exterior envelope (windows, walls) Roof Foundations and basements 	<ul style="list-style-type: none"> Courtyards Unimproved fields Athletic fields Playgrounds Parking lots Campus roads Signage Traffic patterns Trees and shrubs Landscaping
Regulatory Compliance	Systems
<ul style="list-style-type: none"> Accessibility Clean air Asbestos Fire Occupant safety Energy efficiency Susceptibility to vandalism Instructional standards 	<ul style="list-style-type: none"> Equipment (including boilers, HVAC systems) Electrical distribution systems Heating and air conditioning controls
DATA TO COLLECT	
<ul style="list-style-type: none"> ▪ What (brand name, model number, serial numbers, etc.) ▪ Quantity and product size (e.g., size 4 or “medium”) ▪ Where ▪ Age ▪ Condition ▪ Working as purchased/designed? ▪ Working as it should be? 	<ul style="list-style-type: none"> ▪ Working as it needs to be, in order to meet the needs of the users? ▪ Repair history ▪ Specialized upkeep requirements (e.g., oil and filter types) ▪ Evidence of future needs ▪ Recommended repair service ▪ Estimated remaining useful life

Source: U.S. Department of Education²²

²¹ Ibid., pp. 27-32.

²² Contents adapted from: Ibid., pp. 29-30.

The U.S. Department of Education recommends that districts conduct a facilities audit on a regular basis (e.g., annually). While district managers, legislative and regulatory bodies, and members of the public may request additional information at intervals, the audit is an important analytical and management tool.²³ Creation of a regular, comparable dataset on the condition of the district's facilities and equipment over time will allow the facilities director to achieve a better understanding how expenditures and interventions (such as maintenance and replacements) impact the overall condition of the district's facilities.²⁴

In addition, a key outcome of a comprehensive facilities audit is a fact-based understanding of actual product life cycles versus expected life cycles. The type of recommended maintenance of a particular product will change over the course of its life cycle, reflecting changes in age, use, and repairs over time.²⁵ One piece of equipment may have a shorter life cycle than an identical piece of equipment elsewhere in the district due to differences in use. A more accurate understanding of product life cycle contributes to more accurate planning and budgeting.²⁶

ROUTINE AND EMERGENCY MAINTENANCE

While a district must plan for unexpected maintenance costs, the M&O department can decrease disruption of the school environment and reduce costs by carefully planning preventative and routine maintenance. **Routine maintenance reduces the incidence of major repairs and extends the lifetime of facilities and equipment.** Such maintenance reduces the chance of catastrophic equipment failure, such as a broken pipe, which can cause expensive damage to other parts of the facility.

Routine upkeep of facilities also mitigates the potential negative impact that equipment failure may have on the learning environment. For instance, routine maintenance diminishes the chance that students will have to learn in a cold classroom because a heater is broken, or that teachers will be forced to teach in a dark classroom when an electric connection malfunctions.²⁷ One expert notes that the ratio of expenditures for routine maintenance to emergency maintenance should be roughly 70:30. In practice, the reverse is often true.²⁸

Experts note that, especially in a time of tight budgets, school districts have to be "very strategic" about how they schedule their maintenance operations.²⁹ At times, a school district may have no choice but to defer some maintenance costs. The question of how long to defer maintenance on a particular piece of equipment of facility is best answered by considering both the importance of the equipment (e.g., an HVAC system versus a pencil

²³ Ibid., p. 27.

²⁴ Ibid.

²⁵ Ibid., p. 26.

²⁶ Ibid.

²⁷ "Planning Guide for Maintenance of School Facilities," Op. Cit, p. 74.

²⁸ Payton-Jones, K. "A Matter of Time: Perspectives on Deferred Maintenance." American School and University, October 2014, p. 14. Available via Ebsco.

²⁹ Ibid.

sharpeners) and a prediction of how long it will be before that piece of equipment breaks down.³⁰

INFORMATION MANAGEMENT

An M&O department must manage large volumes of information, including staff schedules, work orders, and procurement documents for multiple sites and personnel. **The U.S. Department of Education’s planning guide states that once a school district grows to have at least 500,000 square feet of facilities, it is worthwhile to invest in computerized maintenance management system (CMMS) software, equipment, and training.**³¹

Experts assert that school districts typically do not have the capacity to build an effective CMMS system in house.³² Many vendors offer CMMS systems to help manage properties of all types, including commercial and industrial facilities. For a school district, an effective CMMS system should include:³³

- **Ways to track inventory status**, including the current location of equipment, detailed records about each piece of equipment, and information about utilities consumption and costs. The CMMS should also include a way to track and manage purchase orders, including data on delivery and cost.
- **Ways to manage personnel**, including records for all maintenance personnel, such as licensure status and specialized training courses. The CMMS should also incorporate a system for tracking performance and cost data related to contractors’ work.
- **Ways to manage maintenance**, including work requests, tracking of current maintenance, and work management function (assigning specific tasks to specific workers).
- **Maintenance records**, including both maintenance histories for each piece of equipment and plans for future maintenance. The CMMS should also store safety plans for each facility and any piece of hazardous equipment.

An effective CMMS program should be compatible with other operating systems that the district uses to manage related sets of information, such as procurement, personnel, and accounting records.³⁴

³⁰ Ibid., p. 74.

³¹ Ibid., p. 34.

³² Kennedy, M. “Computer-Assisted Maintenance.” *American School and University*, April 2012, p. 26. Retrieved from EBSCOHost.

³³ Ibid., p. 26.

³⁴ “Planning Guide for Maintenance of School Facilities,” Op. Cit. p. 34.

ENERGY EFFICIENCY

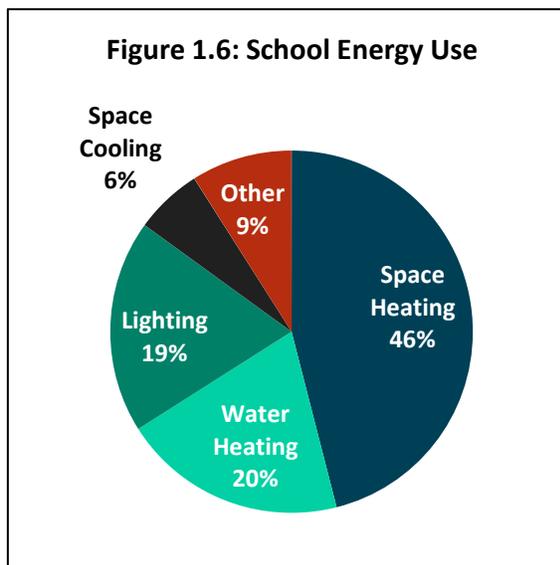
Energy costs represent about one-third of M&O department expenditures, and 2.2 percent of overall district budget.³⁵ Data collected by the U.S. Department of Energy (U.S. DOE) and reported in a guide compiled by Xcel Energy indicate that schools use most of their energy for space heating, water heating, and lighting.³⁶ Figure 1.6 shows energy use for a typical school building.

Energy is a “controllable” cost, meaning that the district can take steps in order to reduce energy use, in turn reducing costs and decreasing adverse environmental impacts.³⁷ Energy cost reduction can take two forms:³⁸

- **Cost-based management:** Reduce district budget allocations or secure lower energy rates from external providers.
- **Usage-based management:** Reduce energy consumption by increasing energy efficiency and control.

While a school district may not have the financial flexibility to pursue cost-based management of energy costs, there may be significant opportunities for usage-based management. One major energy provider estimates that 25 percent of school energy costs could be reduced. It underscores this assertion by noting that the most energy efficient schools – those with an Energy Star label – cost “40 cents per square foot less to operate than the average performers.”³⁹

A 2004 energy efficiency guide for school districts, commissioned by the U.S. DOE, encourages school districts to establish clearly-defined energy objectives that set goals and guide energy efficiency projects.⁴⁰ District-wide energy objectives also communicate to all members of the school community ways in which they can improve energy efficiency. A



Source: Xcel Energy

³⁵ [1] Agron, Op. Cit.

[2] “Managing Energy Costs in Schools: A guide to energy conservation and savings in K-12 schools.” Xcel Energy, 2007. p. 4. <https://www.xcelenergy.com/staticfiles/xcel/Marketing/Managing-Energy-Costs-Schools.pdf>

³⁶ “Managing Energy Costs in Schools,” Op. Cit.

³⁷ “School Operations and Maintenance: Best Practices for Controlling Energy Costs.” Princeton Energy Resources International, 2004. p. 6. <http://www.azdeq.gov/function/about/download/greenguide2.pdf>

³⁸ Ibid., p. 6.

³⁹ “Managing Energy Costs in Schools,” Op. Cit., p. 3.

⁴⁰ “School Operations and Maintenance,” Op. Cit., p. 16.

district can translate these energy objectives into regular evaluations and energy use “report cards” for each school in the district.

In developing and implementing energy objectives, a district may want to consult widely-used standards for energy efficiency, such as the Energy Star scores for K-12 schools, administered by the U.S. Environmental Protection Agency (EPA) and the U.S. DOE, or Leadership in Energy and Environmental Design (LEED) Certification, administered by the U.S. Green Building Council.⁴¹

Many organizations, including non-profits that focus on energy efficiency and the U.S. DOE, have guides to help school districts increase the efficiency of their energy use. For example, the U.S. DOE guide outlines the following opportunities for energy efficiency improvement:⁴²

- Keep lamps clean (dirty lamps can reduce light output by 15 percent).
- Use window blinds or window film to manage the amount of solar heat loss or gain.
- Examine light placement. Remove lamps near natural light sources, such as windows and doors.
- Install occupancy sensors and time controls to ensure lights are on only when students/staff are present.
- Ensure computers, printers, and copiers are turned off when not in use.
- Examine HVAC systems for leaks and dirty fans/filters.
- Install temperature sensors in vending machines.

The most valuable source of information on energy efficiency opportunities may be a school district’s local gas and electric utility company. Utilities providers are often interested in forming high-profile “public partnerships” with local institutions such as schools. As such, they may be able to provide technical, financial, and administrative support as a district works to develop and implement energy objectives.⁴³

⁴¹ [1] “ENERGY STAR Score for K-12 Schools.” ENERGY STAR. <http://www.energystar.gov/buildings/tools-and-resources/energy-star-score-k-12-schools>

[2] “LEED Certification.” U.S. Green Building Council. <http://www.usgbc.org/certification>

⁴² “School Operations and Maintenance,” Op. Cit., pp. 51-72.

⁴³ Ibid., p. 16.

SECTION II: STAFF SIZE AND ROLES

As the largest cost associated with maintenance departments, personnel costs – including salaries, benefits, and overtime – are an important consideration when optimizing efficiency and cost-effectiveness of M&O department operations.⁴⁴ This section details considerations for determining maintenance department staff roles and staff size. It also discusses the management of contract maintenance staff.

MAINTENANCE DEPARTMENT STAFF ROLES

The division of labor within a public school district’s maintenance department may be conceived in three broad categories: custodial, maintenance, and grounds staff. The job responsibilities of each are delineated as follows:⁴⁵

- **Custodial staff** members are typically responsible for keeping facilities clean and performing small maintenance tasks.
- **Maintenance workers** – including electricians, HVAC specialists, locksmiths, and carpenters – generally perform work that requires specialized skills. They are often based out of a central district office and service multiple facilities as needed.
- **Grounds workers** are responsible for maintaining outdoor spaces, such as athletic fields and parking lots.

In a larger district, an M&O department includes a small number of supervisory and clerical staff.

While the delineation of job responsibilities among different types of facilities maintenance staff can be grouped into three overarching categories, some M&O staff appear to occupy dual roles in a district. For instance, a custodian may also devote a portion of his or her time to the upkeep of school grounds.⁴⁶ In some districts, a custodian may also serve as a school bus driver.⁴⁷ Indeed, the seasonal and time-flexible nature of many M&O roles provides districts with flexibility in how they assign specific responsibilities to their M&O staff.

Many larger districts increase resource and time efficiency by having their custodial staff work in teams. Instead of having one custodian responsible for all cleaning responsibilities in a particular area (e.g., dusting, vacuuming, trash removal, washing floors), a team of

⁴⁴ Agron, Op. Cit.

⁴⁵ “Facilities & Maintenance Operations: Classified Adequacy Staffing Report.” State of Washington Office of Superintendent of Public Instruction, December 2010. p. 6.
<http://www.k12.wa.us/SchFacilities/Publications/pubdocs/FacilitiesMaintenance.pdf>

⁴⁶ See for example: “Maintenance Staff Directory.” Independent School District 15.
<http://www.stfrancis.k12.mn.us/page.cfm?p=2843&&directoryStart=1>

⁴⁷ See for example: Hanstein, B. “Board Allows for Sub-Contracting out District’s Custodial Services and Sets Budget.” *Daily Bulldog*, April 26, 2012. <http://www.dailybulldog.com/db/features/board-allows-for-sub-contracting-out-districts-custodial-services-sets-budget/>

custodians covers a larger area with each member responsible for a particular task. This practice reduces the need for multiple pieces of cleaning equipment.⁴⁸

Custodians may also be called upon to perform light maintenance duties that do not require specialized training, such as changing light bulbs or replacing a fuse. Having custodians perform light maintenance duties often takes less time since they are on site, whereas a maintenance specialist may have to travel from a central district office.⁴⁹

SPECIALIZATION

The work of an M&O department requires increasingly specialized work. While the work of generalist employees (e.g., cleaning, fixing locks, clearing snow) remains, M&O departments also need to consider how changes to current and future workloads may require increased specialization of staff. Potential changes that may impact maintenance staff roles include:⁵⁰

- Advances in technology,
- Building codes and regulations, and
- Complex facility systems.

While a school district always has the opportunity to hire contractors to perform specialized tasks (such as repair of a particular piece of equipment), districts should assess whether it is worthwhile to hire a specialist, or train a current staff member to perform specialized tasks.

MAINTENANCE DEPARTMENT STAFF SIZE

A variety of factors impact efficient M&O department staffing. Like the overall M&O budget, the size and allocation of M&O staff is dependent upon the characteristics of the district, especially district size, the number of facilities, and the age of facilities.

Figure 2.1 presents M&O staffing data for school districts in Minnesota for which reliable information is publicly available. The majority of M&O employees are allocated to custodial staff, with the ratio of students per custodian ranging from 132 students per custodian in Mankato Area Public Schools to 158 students per custodian in Grand Rapids Public Schools. Maintenance staff typically comprise a smaller proportion of the M&O department than do custodial workers and grounds staff generally represent the smallest number of staff members in the department.

Factors to consider when determining optimal maintenance department staffing include the size of the district as well as the number and age of district facilities.

⁴⁸ "Planning Guide for Maintenance of School Facilities," Op. Cit., p. 82.

⁴⁹ Ibid., p. 83.

⁵⁰ Earthman and Lemasters, Op. Cit., p. 17.

Figure 2.1 M&O Staffing in Selected Minnesota School Districts

DISTRICT	TOTAL M&O STAFF*	CUSTODIAL STAFF	MAINTENANCE STAFF	GROUNDS STAFF	# OF BUILDINGS	ENROLLMENT
Grand Rapids Public Schools (ISD 318)	33	25	4	1	15	3,959
St. Francis Public Schools (ISD 15)	47	34	7	4	8	5,197
Mankato Area Public Schools (ISD 77)	74	58	10	2	24	7,649
Bloomington Public Schools (ISD 271)	100	78	14	7	23	10,690

*Includes supervisory and clerical staff

Source: National Center for Education Statistics and district websites⁵¹

One indicator of efficient staff use is the amount of space for which each M&O staff member is responsible. The 2014 MSBO survey of Michigan school districts provides these data for different categories of M&O employees. Figure 2.2 presents an overview of these data and indicates that there is approximately one custodial staff member per 30,000 instructional square feet, while there is an average of one maintenance staff member per 185,000 instructional square feet. The CGCS study reports a similar square footage per custodian ratios in large urban districts: 25,501 sq. ft. per custodian.⁵² This supports the assertion that they are generally more custodial staff than maintenance staff in a typical M&O department.

⁵¹ [1] Number of Schools and Total Enrollment for 2012-13 school year, from "Local Education Agency (School District) Universe Survey", National Center for Education Statistics, 2012-13.

<https://nces.ed.gov/ccd/elsi/default.aspx?agree=0>

[2] "Staff Directory." Independent School District 318.

<http://www.isd318.org/page/members/letter/all/building/all/15764/all/all/emptydata/>

[3] "Maintenance Staff Directory," Op. cit.

[4] "Custodial and Maintenance Information." Mankato Area Schools.

<https://sites.google.com/a/isd77.k12.mn.us/buildings-grounds/>

[5] "Staff Directory." Bloomington Public Schools. <http://www.bloomington.k12.mn.us/staff/staff-directory>

⁵² "Managing for Results in America's Great City Schools," Op. Cit., p. 91.

Figure 2.2 Sq. Ft. per M&O Full-Time Employee

BUDGET ITEM	ALL DISTRICTS	DISTRICTS WITH 10,001 – 18,000 STUDENTS
Instructional Square Feet per Custodial FTE	35,247	27,939
Instructional Square Feet per Skilled Trades/Maintenance FTE	185,890	185,890
Instructional Square Feet per Supervisory FTE	670,170	68,1764
Acres per Grounds FTE	81	112

Source: Michigan School Business Officials⁵³

School districts report that the amount of space for which individual M&O staff members are responsible has been growing steadily over the past decade. The MSBO study reports that average square footage per custodial FTE in 2012-13 was 51 percent greater than in 1999-2000. The area of responsibility for maintenance workers grew by 46 percent and the area covered by grounds workers grew by 17 percent in the same period.⁵⁴ The ASU study and CGCS study report similar growth of space per M&O employee.⁵⁵ It is not clear the extent to which this growth in area responsibility per M&O employee is due to growth in the number/size of facilities or cutbacks in M&O staff.

Allocating staff members to specific areas of facilities maintenance is dependent on district needs and characteristics. The U.S. Department of Education offers general guidelines for allocating custodial staff within a school district. Figure 2.3 illustrates the level of cleanliness achieved by a single, adequately supplied custodian working an eight hour shift over a specified square footage.

Figure 2.3: Staff Required for Adequate Maintenance

CLEANLINESS LEVEL	MINIMUM AREA*	MAXIMUM AREA*
Spotless cleaning	10,000	11,000
Intensive cleaning	18,000	20,000
Cleaning required to ensure the health and comfort of building users	28,000	31,000
Cleaning not generally acceptable for a school environment	45,000	50,000
Cleaning that is not considered healthy	85,000	90,000

* Measured in square feet.

Source: State of Washington Office of Superintendent of Public Instruction⁵⁶

In addition, sources suggest that districts use short- and long-term goals to determine the level of staffing needed to accomplish goals laid out in a maintenance plan.⁵⁷ This allows the

⁵³ Moles, Op. Cit., pp. 10-12.

⁵⁴ Ibid., p. 7.

⁵⁵ [1]The ASU reports that in 2008-09, custodial area of responsibility had increased almost 20 percent compared to the previous year. Agron, Op. Cit.

[2] See "Managing for Results in America's Great City Schools," Op. Cit. in addition to editions of the report from previous years.

⁵⁶ Table contents taken verbatim from: Facilities & Maintenance Operations: Classified Adequacy Staffing Report," Op. cit., p.10.

planning to reflect specific characteristics of the district. For instance, some districts may find that improvements in building material maintenance and technology result in reduced need for maintenance and care. At the same time, building systems and equipment are increasingly complex, perhaps requiring specialized knowledge to maintain. Thus when considering personnel use, an M&O department should consider not only the number of staff for a given amount of space but also how their roles meet the needs of the district.

CONTRACTING MAINTENANCE SERVICES

A district may consider contracting out some of the M&O department duties for a number of reasons, including lack of capacity to perform a specific function of immediate need, budgetary restrictions on full-time M&O staff, or more cost-effective pricing for regular or seasonal services (e.g., snow removal, window washing). In addition, experts note that M&O staff can learn valuable skills through interaction with contractors who perform work in the district.⁵⁸

The decision to hire a contractor should be made carefully and in accordance with district procurement guidelines. While contracting out services may initially seem like a cost saving measure, experts caution districts to consider additional costs associated with contracting that may not be immediately obvious. These costs had several sources, including:⁵⁹

- **Loopholes in the contract**, which often manifest as allowances for the contractor to bill more than the base amount
- **Misleading cost-benefit analyses** that ignore some costs or miscalculate future trends
- **Indirect costs**, typically about 20 percent of the total contract, that the district incurs to manage the contract (e.g., to pay lawyers or accountants)
- **Monitoring responsibilities** that require time or, if ignored, can lead to underperformance and cost overruns
- **Unrealistic introductory rates** on first-time contracts that later can only be renewed at higher rates
- **Lack of competition**, resulting from the contractor's dominance of the local market, may drive the price of services up

Management of an M&O contract itself may require significant time and expertise. A district employee will have to serve as project manager, a role whose responsibilities include managing procurement, outlining the scope of work of the contract, and monitoring contractor performance.⁶⁰

⁵⁷ Ibid., pp. 16-18.

⁵⁸ "Planning Guide for Maintenance of School Facilities," Op. Cit., p. 117.

⁵⁹ Adapted from: Mathis, W. and L. Jimerson. "A Guide to Contracting Out School Services: Good for the School? Good for the Community?" Great Lakes Center for Education Research and Practice, March 2008. pp. 12-15.
http://greatlakescenter.org/docs/Policy_Briefs/Mathis_ContractingOut.pdf

⁶⁰ "Planning Guide for Maintenance of School Facilities," Op. Cit., p. 117.

CONTRACTING CUSTODIAL SERVICES

Custodial staff salaries and services are often the largest part of an M&O department's budget. A growing number of school districts have chosen to sub-contract their custodial services to a private firm in order to reduce costs. Of the 111 Michigan school districts surveyed by MSBO in 2014, 47 (43.4 percent) sub-contracted "all, or most of their custodial work."⁶¹ This represents a four-fold increase in the percentage of Michigan school districts that sub-contract custodial work since the 2006-2007 school year, when 10.4 percent of school districts sub-contracted that work. The districts that sub-contracted work in 2014 range in size from 636 students to 15,238 students.⁶²

A decision to sub-contract custodial work can be controversial and ought to consider input from the workers and community who will be affected. In many cases where a district decides to sub-contract custodial work, most district custodians are immediately re-hired by the contracting company.⁶³ However, in many cases the custodians are represented by unions that may oppose any changes to current practice. In Portland, Oregon a local union representing custodial staff sued Portland Public Schools (PPS) following its 2002 decision to sub-contract custodial services. The school board said that by hiring a sub-contractor, the district would save almost \$10 million in two years.⁶⁴ However, in 2005, the Oregon Supreme Court sided with the union. PPS offered to re-hire laid off custodians and paid a \$14.5 million settlement to cover losses suffered by district custodians who had lost their jobs.⁶⁵

⁶¹ Moles, Op. Cit., p. 1.

⁶² Ibid., p. 1.

⁶³ See for example: Hanstein, B., Op. Cit.

⁶⁴ "Q & A: Sub-Contracting for Custodial Services." Portland Public Schools. http://www.pps.k12.or.us/news-c/faq/contract_custodial.php

⁶⁵ "Portland Public Schools, Custodians Announce Tentative Settlement, Ending Years of Litigation." Portland Public Schools, April 23, 2007. <http://www.pps.k12.or.us/news/2341.htm>

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