

**UNIVERSITY OF MINNESOTA  
PHYSICAL PLANT OPERATIONS:  
A FOLLOW-UP REVIEW**

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Office of the Legislative Auditor  
State of Minnesota



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PHYSICAL PLANT OPERATIONS:  
A FOLLOW-UP REVIEW**

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**July 1991**

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Office of the Legislative Auditor  
State of Minnesota





STATE OF MINNESOTA

**OFFICE OF THE LEGISLATIVE AUDITOR**

VETERANS SERVICE BUILDING, ST. PAUL, MN 55155 • 612/296-4708

JAMES R. NOBLES, LEGISLATIVE AUDITOR

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July 1, 1991

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Legislative Audit Commission

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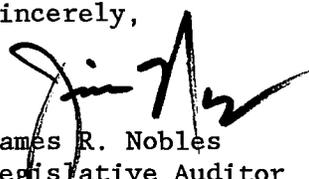
We are transmitting to you two reports on the University of Minnesota's Physical Plant Department. One report was completed by our Program Evaluation Division and the other by our Financial Audit Division.

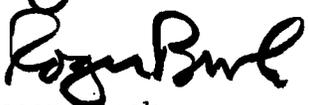
Both reports assess what progress the University has made in correcting the problems we found in a 1988 study of the department. Both reports conclude that some progress has been made, but they also point to significant problems that remain.

During the three years since our first report, a new management team has been put in charge of the University's Physical Plant Operations. They want change, and they have worked hard to develop a plan to achieve it. However, their plan has not been implemented and the Physical Plant must still go through a difficult transformation to become a cost-effective and well-managed organization.

We received full cooperation from University administrators and employees, and we appreciate their help.

Sincerely,

  
James R. Nobles  
Legislative Auditor

  
Roger Brooks  
Deputy Legislative Auditor  
Program Evaluation Division

  
John Asmussen, CPA  
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# **EXECUTIVE SUMMARY**



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# EXECUTIVE SUMMARY

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**P**hysical Plant Operations is a major support department of the University of Minnesota's Twin Cities campus. It employs over 1,300 workers and spends \$79 million a year to repair, clean, heat, and cool campus buildings. In August 1988, our office issued a program evaluation and financial audit of Physical Plant. We found a need to improve financial controls, operating efficiency, and employee supervision--particularly in Physical Plant's maintenance shops. In February 1990, we conducted a brief review of changes at Physical Plant and concluded that "the progress still required by Physical Plant is more noteworthy than the progress that has been made." In April 1990, the University hired a new Assistant Vice President for Physical Plant, and she finished assembling a new management team in October 1990.

In February 1991, we began a more complete follow-up of our 1988 Physical Plant report. In addition to a review of management issues and Physical Plant's maintenance and custodial operations, the follow-up included a financial audit. We asked:

- **What changes have occurred since our 1988 report, and what have been the effects of these changes so far?**
- **How do Physical Plant's costs and staffing levels compare to other universities'?**
- **Does Physical Plant adequately manage its finances, and does it have appropriate internal controls?**
- **Are Physical Plant's customers satisfied with maintenance and custodial services?**

Overall, we found that Physical Plant's new management team has articulated a reasonable plan for improving cost-effectiveness, accountability, customer satisfaction, and financial controls. Some important foundations have been laid for future changes. But change has been slow in the three years since our original report, and most of the problems cited in 1988 still exist. It remains to be seen whether management's proposed changes, which constitute the most significant reorganization in the recent history of Physical Plant, will result in a more cost-effective organization that improves service to customers and has the confidence of employees.

Our financial audit suggests that Physical Plant has several material weaknesses in its internal control structure that impair its efforts to achieve important financial objectives. Because some of these weaknesses result from more general problems with University financial systems, Physical Plant will need the support of University administrators to make the recommended changes.

## SHOP AND CUSTODIAL OPERATIONS

Our 1988 report found that Physical Plant was an expensive and often inefficient operation--particularly the maintenance shops. Work was not properly planned and there was an inefficient system for transporting workers to job sites. Compared to workers in similar organizations, shop workers were more specialized and more highly paid. Physical Plant lacked an effective preventive maintenance program. There was inadequate supervision of both maintenance and custodial workers.

Most of these problems still exist today, although management has started to address some of them. We reviewed data from a national survey of university physical plant costs and found that:

- **The University of Minnesota's costs for custodial and maintenance services are still above the norm for similar universities.**

In 1989-90, the University of Minnesota employed fewer custodians per square foot than comparable universities. However, Physical Plant's custodial costs per square foot were about 40 percent higher than the median costs of other Midwest research universities. It is not clear whether this is solely due to higher salaries, but we did find that Physical Plant's starting salaries are higher than those paid by most comparable schools, and its average salaries are higher than those paid by most Twin Cities employers.

Minnesota's 1989-90 building maintenance costs per square foot were about one-third higher than the median of other Midwest research universities, and the starting salaries of selected trades workers were 24 to 43 percent higher. The University negotiated a contract with the trades workers in June 1990 that reduced overtime and premium pay, but did not change its practice of paying prevailing construction wages to maintenance workers.

We also examined customer satisfaction with Physical Plant's maintenance and custodial work. Based on 303 survey responses from University deans, department heads, and program directors (a 75 percent response rate), we found that:

- **Most customers believe that Physical Plant's maintenance work is high quality, but inefficient and too costly. Most customers think that custodial service levels are inadequate.**

One of the main causes of shop inefficiency cited in our 1988 report was the lack of work planning and scheduling. To date, only minor improvements have been made, although management intends to fully implement daily work scheduling, backlog monitoring, and systematic preventive maintenance in 1991. We found that 32 percent of a recent sample of shop tickets from the Minneapolis campus had time estimates, compared to 10 percent in 1988. Despite this improvement, the Minneapolis shops still lag far behind the St. Paul shops, which develop estimates for 70 percent of shop tickets. Physical Plant has improved its system of transporting workers to job sites, mainly through the purchase of additional vehicles and by encouraging workers to walk, when possible.

The adequacy of Physical Plant supervision will depend largely on the quality of people selected to fill supervisory positions recently restructured by management. Through internal promotion or outside hiring, more than 40 people will be selected in 1991 to supervise maintenance and custodial workers. Physical Plant continues to have insufficient in-house supervisory training. Management hired a personnel consultant in 1990--partly to develop supervisory training--but only one two-day course was offered in the past year, in addition to considerable one-on-one training. Also, most Physical Plant employees still do not receive performance appraisals from their supervisors.

## ORGANIZATION AND MANAGEMENT

Our 1988 report noted that effective organizations have several common characteristics. Such organizations have logical reporting relationships, clear lines of authority, effective internal and external communications, high morale, and clear objectives. In 1988, we found that Physical Plant had an awkward and ineffective organizational structure. Management did not communicate effectively with employees, and employees distrusted management. Physical Plant management also did not communicate effectively with other University units, including the Board of Regents. We reviewed these issues again in 1991.

In general, Physical Plant has a more effective organization and management team today than it had three years ago. Physical Plant now reports to the Senior Vice President for Finance and Operations, who has been able to commit more time to Physical Plant issues than did the Vice President for Academic Affairs. Several of Physical Plant's top managers have been replaced, resulting in a more cohesive management team that seems to be working toward common goals.

Our conclusions about the effectiveness of Physical Plant's organization and management team are tentative because a major reorganization is now being implemented. Management wants to improve the efficiency and effectiveness of Physical Plant's services, while encouraging wiser investments of construction and maintenance funds in University facilities. Most shop employees will work in only one part of the campus, rather than being dispatched from a central location to a variety of work sites around campus. Within each zone

of campus, a general supervisor will oversee the work of both custodians and maintenance workers, who now function separately. In a broad sense, we think management has conceived a reasonable plan. However, the plan must stand the test of implementation, and management still needs to articulate timelines for improvements and measurable objectives.

Internal communications within Physical Plant have improved since 1988, but there remains considerable room for improvement. About 100 supervisors have been trained in communication skills, and the management team has taken more time to meet with employees and respond to questions. However, management decided to announce its reorganization proposal to employees before all of the details were worked out, which has engendered distrust and resentment among many employees. Management has expressed a commitment to greater employee involvement in decision making under the new organization.

Physical Plant management has, with considerable success, given high priority to improving its relations with external groups, such as the Board of Regents, University departments, and organized labor. However, we think the relationship between Physical Plant and the University's Office of Physical Planning needs to be addressed. Physical Plant management's recently-stated goal of managing facilities on the Twin Cities campus, rather than simply providing custodial and repair services to buildings, potentially duplicates the role played by Physical Planning.

## FINANCIAL MANAGEMENT

Our 1988 audit revealed numerous deficiencies in Physical Plant's internal control structure. We found incomplete financial information and inadequate budget techniques. We also expressed concern about the equity of rates charged for services and the potential cost of the University's deferred maintenance backlog. The 1988 audit also cited several areas, such as inventory and personnel, that needed better control procedures.

In our current audit, we found that:

- **Most of Physical Plant's problems with internal controls remain unsolved. The new management team has concentrated its initial efforts on addressing the fundamental flaws in Physical Plant's control environment and accounting system.**

The current internal control structure contains significant material weaknesses which impair management from achieving important financial objectives. In addition, we again found several deficiencies in the control procedures used by Physical Plant.

Of particular concern, the financial information on Physical Plant's operations remains incomplete. The University accounting system provides Physical

Plant with financial information on only the portion of service costs paid for from Physical Plant's operating budget. For fiscal year 1990, we identified additional expenditures of \$23 million for services which Physical Plant charged to other University department budgets. These additional expenditures account for over 30 percent of Physical Plant's total service costs. Further, the lack of information in University accounting records prevented us from verifying the accuracy and completeness of these additional expenditures. As a result, we concluded that Physical Plant's financial information provides an unreliable basis for assessing its operations.

We found that Physical Plant continues to lack a clear definition of the basis for its operating budget. Management has not clearly articulated what levels and types of services it intends to provide from the operating budget. Thus, we could not determine whether expenditures qualified as "routine" services payable from Physical Plant's operating budget or "nonroutine" services for which the user department was liable. Further, there is no clear policy on which University activities should be defined as "support" activities, which entitles them to receive Physical Plant services at no charge.

The lack of precision in the Physical Plant budget has resulted in the accumulation of significant residual balances. As of June 30, 1990, over \$19 million was unspent. Of this amount, \$12.7 million was committed to long-term encumbrances, \$5.5 million had been accumulated for specific operating and asset replacement reserves, and \$1.5 million was available free balance. Ironically, the residual balances have accumulated at a time when Physical Plant has a sizable backlog of deferred maintenance. Physical Plant has identified maintenance deficiencies at the University that it estimates would cost \$300 million to correct. However, the University has not formulated a meaningful plan for how to address a problem of such magnitude with its limited resources.

We also found that Physical Plant has accumulated and utilized its heating plant reserves in an arbitrary manner. Our 1988 audit cited the volatile financial activity of the heating plant as a problem. Physical Plant has since begun to accumulate reserves to counter this volatility. However, we found that the reserve amounts were calculated arbitrarily and that operating reserves have been used in an inequitable manner. Physical Plant used \$1.6 million of operating reserves to pay off a loan to central administration and \$1.3 million to finance deficits which had accumulated in the utility budget for "support" units.

Finally, we found various problems with the control procedures for several financial areas. We identified problems with controls over inventory, billings, and payroll costs. We also questioned the amounts paid for some repair and replacement projects and settlements made by central University administrators with past Physical Plant administrators.

Physical Plant management has taken note of the weaknesses in its internal control structure. The new management team has concentrated its initial efforts on addressing concerns relating to Physical Plant's control environment and accounting system. It has devised a new organizational structure and

begun efforts to communicate its expectations and philosophy. Also, the University is developing a new accounting system.

We recognize that management must address these fundamental issues first. Once the management team has established the importance of internal control in Physical Plant, it will be more successful in designing and implementing effective control procedures.

## RECOMMENDATIONS

Most of the problems we found in our 1988 review of Physical Plant still exist today, and many of the earlier recommendations are still applicable. Within this report, we make many recommendations for specific changes. A few of our most important recommendations are worth highlighting here.

Although we are encouraged that Physical Plant's current managers appear to have worked hard in the past year to address the department's deficiencies, there has been less progress than we think is reasonable in the three years since our first report. We think the University should be held more accountable for results than it has been in the past.

To accomplish this, it is essential that Physical Plant managers develop more concrete objectives for improvement, particularly related to the cost of services. Physical Plant remains an expensive operation, and costs are a primary source of frustration with University customers. Management should set goals for efficiency and cost control, and have more specific timetables for making changes within the department.

Physical Plant also needs to address the basic weaknesses in its internal control structure. To improve financial management and track progress toward objectives, Physical Plant management must have more complete information on its expenditures. Management must also establish the policies that clarify which services will be paid from Physical Plant's budget.

In addition, management should do better financial planning. Physical Plant has not maximized its own funds at a time when the University has a large deferred maintenance problem. Physical Plant has also set rates for utilities without determining the appropriate levels for operating and capital reserves.

Finally, we think the University should clarify the respective roles of Physical Plant and the Office of Physical Planning. These roles have never been clearly distinguished, but Physical Plant management's new focus on facilities management heightens the need for clarification. If necessary, the University should consider merging functions.

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# INTRODUCTION



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# INTRODUCTION

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**P**hysical Plant Operations is a major support department of the University of Minnesota.<sup>1</sup> The department currently employs over 1,300 workers and spends \$79 million a year to perform a variety of maintenance and custodial tasks, including cleaning classrooms and offices, heating and cooling campus buildings, and repairing and maintaining buildings and equipment.

We issued a report on Physical Plant in August 1988. The report was critical of Physical Plant's financial operations and its management of maintenance and repair activities. The report also made numerous recommendations.

When we issued our 1988 report, we said that we would conduct a follow-up review in 1990. However, at the request of the University, we scaled back that reassessment. Instead, in February 1990, we issued a brief status report on Physical Plant. We noted that the University had accepted the need for change and taken some steps toward improvement. But we said that the essential goal of making Physical Plant a more cost-effective organization had not been achieved and was, in fact, a considerable distance off.

In February 1991, we began another--and more extensive--reassessment of Physical Plant. Our Financial Audit Division conducted a review of the department's financial operations, and our Program Evaluation Division reviewed the department's management of maintenance and custodial activities. Both reviews focused on what progress has been made in addressing the problems cited in our 1988 report.

In the review by our Program Evaluation Division, we asked:

- **Has Physical Plant improved its work planning and supervision?**
  
- **To what degree has Physical Plant restructured its agreements with the building trades to achieve greater productivity and cost effectiveness?**

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*1* In early 1991, Physical Plant Operations changed its name to Facilities Management. In this report, in order to limit confusion, we continue to refer to this department as Physical Plant Operations or Physical Plant.

- **To what degree has Physical Plant developed and implemented a more adequate preventive maintenance system?**
- **What changes in management and organization have occurred since our 1988 report?**
- **What progress has Physical Plant made in improving its relations with its employees, other University departments, and the Board of Regents?**
- **Are the people and departments served by Physical Plant satisfied with its maintenance and custodial services?**

To answer these questions, we interviewed Physical Plant managers, Regents, labor representatives, and University officials. We also talked with about 60 Physical Plant supervisors, custodians, and shop employees. To help evaluate customer satisfaction with Physical Plant services, we conducted a survey of University deans, directors, and department heads. Finally, we reviewed existing data sources, such as comparative cost and staffing data from the Association of Physical Plant Administrators of Universities and Colleges.

In our financial audit, we examined these finance-related activities:

- **Budgeting,**
- **Charges for services,**
- **Payroll/Personnel,**
- **Utilities,**
- **Repair and replacement,**
- **Purchasing, and**
- **Inventory.**

The objective of our financial audit was to determine the extent to which Physical Plant has established adequate financial controls and complied with all finance-related legal requirements. To make this determination we analyzed various financial information from the University's accounting system, reviewed University and Physical Plant policies and procedures, interviewed staff involved in financial management decisions, and tested selected transactions for compliance with applicable legal provisions and established policies.

## SUMMARY OF 1988 FINDINGS

Since this review was undertaken as a follow-up to our 1988 report, a summary of our original findings would be helpful.

Our 1988 study found that the University of Minnesota's building maintenance costs per square foot were higher than those of other Big 10 universities. We found that Minnesota's practice of paying prevailing construction wages to maintenance shop workers was unusual among maintenance organizations and contributed to these higher costs.<sup>2</sup> The University is not required by law to pay its workers prevailing construction wages, but it has been the policy of the Board of Regents to do so. We also found that Physical Plant has a more specialized labor force than most other maintenance organizations, resulting in inefficiencies. For example, many routine jobs required the work of specialists from more than one trade, and lower-paid general mechanics were not being assigned some tasks that they were capable of doing.

In addition, our 1988 report found serious problems with Physical Plant's system of work planning and scheduling, including:

- **unclear work order assignments, failure to assign priorities to work orders, and failure to estimate the time and cost of jobs;**
- **the inability of management to track the activities of trades workers, to determine work order backlogs, or to document and evaluate the work performed;**
- **inadequate management oversight of the shops and failure to delineate the responsibilities of non-union "area managers" and union foremen;**
- **an inadequate preventive maintenance system that had developed over time with little central direction or engineering input; and,**
- **an inefficient and costly system for transporting workers and materials to job sites.**

We found fewer problems in Physical Plant's custodial operations, although our review of custodial practices was more limited than our review of the shops. Custodians appeared to be using appropriate work practices and doing a good job of cleaning. We found some evidence of workload imbalances and suggested that Physical Plant should standardize and document expected service levels and time standards for all tasks. We also found a need for better custodial supervision.

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<sup>2</sup> "Prevailing wages" are wages commonly paid to the largest number of workers of the same trade in the local area.

Our 1988 report questioned Physical Plant's organizational structure. For example, we questioned why Physical Plant reported to the University's Vice President for Academic Affairs, whose responsibilities for academic issues left little time for Physical Plant oversight. We also found that Physical Plant had too many division heads reporting to the director.

In 1988, Physical Plant suffered from internal communication problems. There was little interaction between the director and his management team. A survey of Physical Plant workers indicated growing dissatisfaction with management and low morale, especially among trades workers.

Physical Plant had strained relationships with other segments of the University as well. It had a poor relationship with the Department of Environmental Health and Safety, resulting partly from Physical Plant's lack of comprehensive health and safety policies and procedures. Physical Plant also had a relationship with the University's Board of Regents characterized by poor communication and mistrust. For example, Physical Plant had, for many years, failed to consult with the Board of Regents about the deteriorating condition of the University's heating plants and steam distribution system. The Board of Regents told us that they were not getting complete and accurate information from Physical Plant, and Physical Plant managers complained about informal meddling in management decisions by individual regents. Finally, we found that Physical Plant and the Office of Physical Planning had a strained relationship and unclear responsibilities for University remodeling projects.

In areas of financial management, our 1988 review found several problems, including:

- **Financial information was incomplete and could not support management decision making,**
- **Policies on charging other departments for services were often unclear or nonexistent,**
- **Budget procedures did not require Physical Plant to fully account for unspent funds,**
- **Physical Plant did not adequately control its budget because it did not segregate the volatile expenses for fuel and utility costs, and**
- **Inventory controls were inadequate.**

## CHANGES SINCE OUR 1988 REPORT

Immediately after the release of our report in August 1988, Physical Plant management initiated an action plan to respond to our recommendations. The plan was presented to the Board of Regents on September 8, 1988. At that time, the University's interim President announced that Physical Plant

would report to the Senior Vice President for Finance and Operations rather than the Vice President for Academic Affairs.

In November 1988, Physical Plant's director commissioned a study to identify problems with the existing management systems and to suggest solutions. The study team, made up of three Physical Plant employees and three IBM specialists, confirmed many of the findings of our 1988 report. It noted that the financial information system was inadequate for planning and scheduling work, estimating costs, documenting and evaluating work, and other requisites for management decision making. It called for establishing a new accounting and maintenance management system by July 1990.<sup>3</sup>

Figure 1 shows the changes in upper management that affected Physical Plant between 1988 and 1991. Physical Plant's top two managers in 1988 left the University within one year of our audit. In addition, there have been two Senior Vice Presidents for Finance and Operations overseeing Physical Plant. These personnel changes have slowed improvements in Physical Plant's operations, but have also played a key role in laying ground for future change.

### Figure 1: Key Personnel Changes Since 1988

February 1989	Gus Donhowe hired as Senior Vice President for Finance and Operations with responsibility for Physical Plant.
March 1989	William Thomas, Associate Provost for Physical Plant, removed from chain of command over Physical Plant.
August 1989	Charles Bailey resigned as Director of Physical Plant (Kirk Campbell appointed Interim Director)
April 1990	Sue Markham hired as Assistant Vice President for Physical Plant.
October 1990	Physical Plant chief financial officer hired, completing the assembly of seven-person management team.
March 1991	Robert Erickson hired to succeed Gus Dunhowe (who died in January 1991) as Senior Vice President for Finance and Operations

Following the Physical Plant director's resignation in August 1989, the interim director took several immediate steps to streamline the operation. The number of divisions was reduced to six and shop foremen were given more responsibility for budgeting. The area managers, whose roles were never clearly defined and who never received the full support of management, were laid off. More than 50 custodial positions were eliminated due to lack of funding.

Our February 1990 status report noted a few improvements in work planning and scheduling but most of the problems cited in the earlier report remained. Physical Plant's layoff of the area managers in 1989 left the shops without non-union supervision. Physical Plant continued to pay trades workers prevailing

<sup>3</sup> University of Minnesota, *Physical Plant Facility Management Study* (Minneapolis, 1989).

construction wages and to have a very specialized work force. Physical Plant engineers had begun to improve the preventive maintenance system, and management had issued a request for proposals for a maintenance management information system. Some improvements had been made in worker transportation, mainly through the purchase of additional vehicles for the shops. We also noted improved relations between Physical Plant management and the Board of Regents. Overall, we concluded that:

The progress still required by Physical Plant is more noteworthy than the progress that has been made.... We think the commitment to change is not shared throughout the organization, and there will be important tests of management's ability in the coming year. For example, can Physical Plant become an organization in which management and workers hold common goals? Will management be able to hold foremen accountable for making their shops productive, cost-effective, and responsive to customer needs? Will Physical Plant management be able to demonstrate that its efforts are improving productivity? Can management make the shops more cost-effective without addressing wage levels? Will management be able to successfully implement an effective management information system, which has been a goal of Physical Plant management for several years?<sup>4</sup>

In April 1990, the University selected a new director of Physical Plant, and designated her Assistant Vice President for Physical Plant. The director completed assembling her new management team, which included three existing managers and three new ones, in October 1990. In February 1991, the director announced a proposed reorganization of Physical Plant. Figure 2 presents this proposed reorganization chart and Figure 3 presents management's objectives for the new organization.

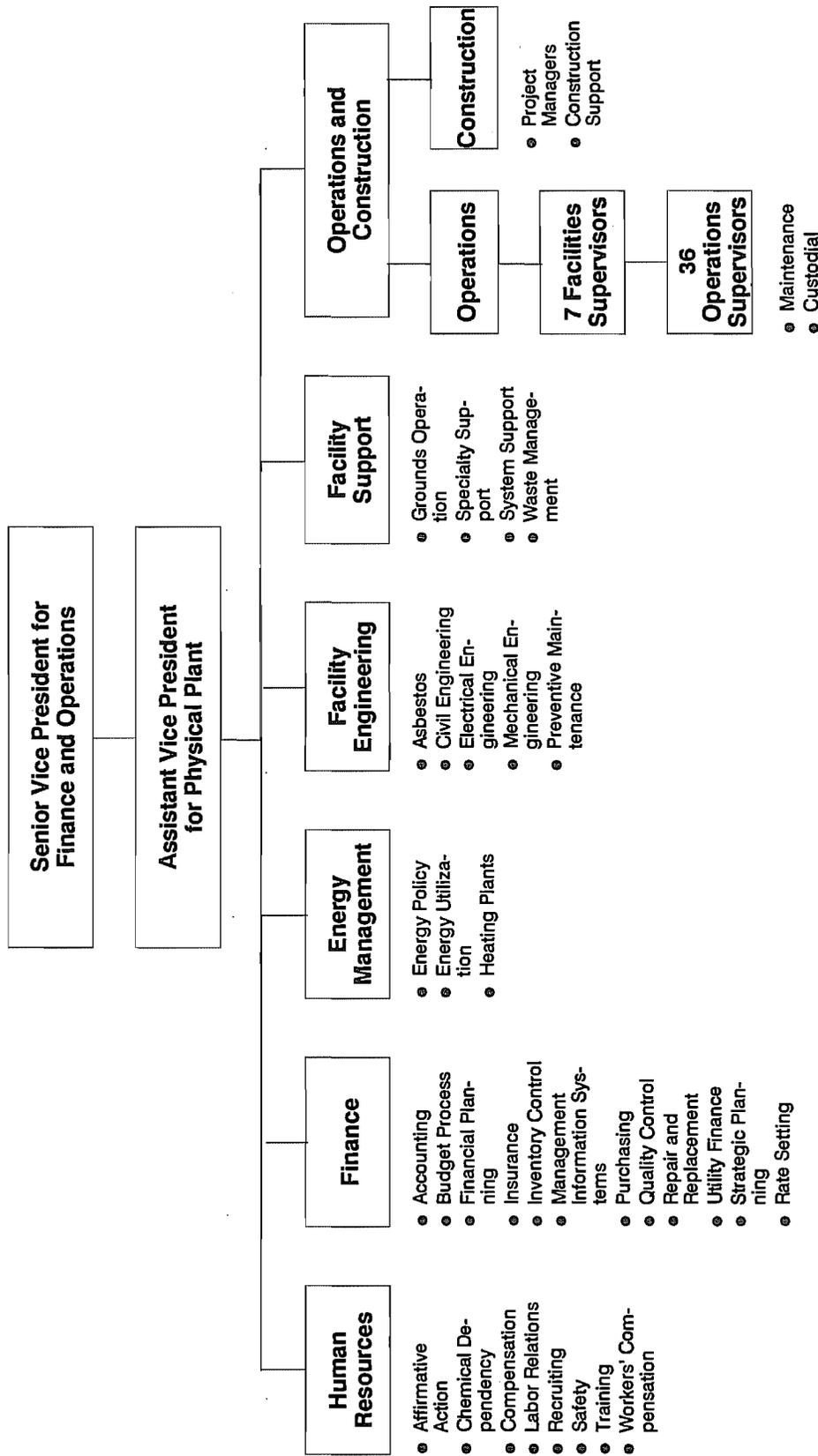
The new organization divides basic maintenance and custodial operations on the Twin Cities campus into seven geographic zones. Seven "facility supervisors" will be responsible for customer service and overall management of maintenance and custodial operations. Zones will be further divided into groups of buildings, for which "operations supervisors" will schedule daily work, supervise maintenance and custodial workers, and manage materials inventories. Maintenance workers will report to their assigned zone rather than the central shops building, and management anticipates that this will encourage worker pride in the buildings they maintain. A separate construction unit will handle major remodeling jobs for the entire Twin Cities campus. Management expects the new organization to have clearer lines of accountability, and wants to hold its operations to efficiency standards that exist in private industry.

Management wants the reorganization to change Physical Plant from being just a service organization to being more of a manager of University facilities. As facilities managers, staff will develop budgets for individual buildings and

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<sup>4</sup> Office of the Legislative Auditor, *Status Report on the University of Minnesota Physical Plant Operations* (St. Paul, 1990), 10-11.

**Figure 2: Physical Plant Organization Chart, July 1991**



Note: The Assistant Vice President for Physical Plant also oversees the Safety and Security Department, including the University Police, fire alarms, and security policies and procedures.

### Figure 3: Objectives of Physical Plant's New Organization

- Deliver more efficient, cost-effective service to the customers.
- Maintain and upgrade the physical assets of the University.
- Coordinate all aspects of facility management, including safety and security.
- Remain flexible enough to meet the changing needs of the University community.
- Manage energy costs in coordination with the University's energy efficiency program.
- Increase the span of control and place appropriate decision making at the lowest possible level.
- Fulfill the decentralization vision that University administration has for support service units.
- Upgrade services to the University through a self-supporting construction division.

Source: Physical Plant reorganization proposal.

ensure that building systems are operated efficiently and effectively (perhaps reducing University energy costs). Management believes that priority should be given to proper maintenance of existing buildings, rather than the construction of new ones.

Physical Plant's director presented the reorganization plan to the Board of Regents in March 1991. Originally, Physical Plant's management planned to begin a phased implementation by April 15 but later delayed implementation until June.

Under management's reorganization proposal, custodians and shop workers will be brought into a single operating division. This will dramatically change supervisory arrangements in the following ways:

- Most shop workers on the Minneapolis campus will work in only one part of campus (their "zone"), rather than being dispatched from a central location to a variety of locations on campus. Thus, the basis for organization will be primarily geographic, not functional.<sup>5</sup>
- Custodians and shop workers will report to the same supervisors in each zone. Previously, custodial and shop operations were distinct within Physical Plant's organization.

<sup>5</sup> Presently, workers on the St. Paul campus and the West Bank and Health Sciences portions of the Minneapolis campus report to zone shops; most people doing work at the remainder of the Minneapolis campus are dispatched from a central location.

- All trades workers in zones will report to civil service supervisors, rather than reporting to general foremen from their trades union.

In both of our reports--which follow--we assess the reorganization proposal, as well as other changes that have been either proposed or implemented by Physical Plant's new management team. In some areas, we also assess the current condition of Physical Plant's operations.



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**REPORT OF THE  
PROGRAM  
EVALUATION DIVISION**



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**PHYSICAL PLANT MANAGEMENT AND  
OPERATIONS: FOLLOW-UP**

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**July 1991**

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**Program Evaluation Division  
Office of the Legislative Auditor  
State of Minnesota**



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# PHYSICAL PLANT MANAGEMENT AND OPERATIONS: FOLLOW-UP

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**I**n this report we present the findings and recommendations of the Program Evaluation Division of the Office of the Legislative Auditor. We examine issues related to overall management, as well as the efficiency, effectiveness, and supervision of maintenance and custodial operations. We ask:

- **To what extent has the University addressed the management problems noted in our 1988 report?**
- **How do Physical Plant's costs and staffing levels compare to those of similar universities?**
- **What do customers think of Physical Plant's maintenance and custodial services?**

We conducted our follow-up research between March and May 1991, and our findings are based on interviews, a survey of University departments, and analysis of existing data. We talked to about 90 people for this review and received written comments from several others. In contrast to our 1988 study, we did not hire technical consultants to evaluate the quality and efficiency of a sample of projects, nor did we conduct a representative survey of Physical Plant's work force.

As in 1988, we focused on maintenance and custodial operations. Nearly three-fourths of Physical Plant's 1,300 employees do maintenance and custodial work. **Maintenance** involves the preservation and minor alteration of the University's buildings and equipment. Most maintenance is done by specialized crafts workers, such as plumbers and electricians, or Teamster mechanics with more general repair skills. The primary aim of **custodial** work is keeping building interiors clean.

For the most part, the sections that follow provide a status report on the findings and recommendations of our previous report. However, for selected issues, we offer some new recommendations based on our subsequent research.

## COSTS, STAFFING, AND ORGANIZATION

Our 1988 study found that the University of Minnesota's building maintenance costs per square foot were higher than other Big 10 universities. In addition, we found that the labor costs of completing routine maintenance tasks (such as unplugging a toilet) were higher at the University of Minnesota than at Big 10 schools and other large employers in Minnesota. The University's practice of paying prevailing construction wages to maintenance shop workers contributed to these higher costs, as did Physical Plant's use of specialized trades workers to do many routine maintenance tasks. We also found that Physical Plant had more maintenance workers than any other Big 10 school.

Our 1988 review of Physical Plant's custodial operations was somewhat less extensive than our review of maintenance. We found that the University of Minnesota employed more custodians than any other Big 10 school, but its average square feet of space cleaned per custodian was typical of other large universities.<sup>1</sup> In a review of 11 employees' work assignments, we found that 10 were assigned duties that would normally take more than eight hours a day to complete. We did not compare the University of Minnesota's overall custodial costs to other universities, but we did note that the University's average hourly custodial salary appeared to be competitive with other private and public Twin Cities employers.<sup>2</sup>

For this follow-up, we reviewed available national data for 1989-90 on university costs and staffing. We relied on survey data compiled by the Association of Physical Plant Administrators (APPA) of Colleges and Universities.<sup>3</sup> We found that:

- **The University of Minnesota's shop operations still have more staff and higher costs than most other universities. The University's number of custodians per square feet is actually lower than the median of other large schools, but custodial costs are higher.**

Higher wages appear to be one of the causes of higher costs, both in maintenance and custodial operations. As discussed elsewhere in this report, other factors--such as the adequacy of supervision and work scheduling--undoubtedly affect overall costs too.

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<sup>1</sup> We noted that: "Ultimately, however, the staffing requirements of an institution depend on the levels of service expected.... Thus, rather than basing our judgments about the University of Minnesota on gross measures of square footage per custodian, we examined the adequacy of staffing for the University's currently specified service levels."

<sup>2</sup> The basis for this finding was an annual survey of salaries by the DCA Stanton Group.

<sup>3</sup> Minnesota is not included in APPA's 1989-90 cost and staffing report because it did not respond to APPA's survey. However, Physical Plant administrators did complete the survey for us so that we could compare Minnesota's results with similar universities.

It is worth noting some cautions about the data we used to make these comparisons. First, APPA does not verify the accuracy of any of the information it receives. It merely summarizes and categorizes data by institution type, size, and geographic region. In comparing individual schools, we found considerable cost variation, more so than seemed reasonable. This included one school that we found to have misreported information to APPA.<sup>4</sup> Second, the costs reported to APPA are affected by the scope of services provided by each university's maintenance operations. For example, the University of Minnesota's Physical Plant maintains its own vehicles and pays to transport its maintenance workers to their jobs, while other universities may have vehicle maintenance and transportation funded from a separate budget. Minnesota has a large medical school on campus, which presents special maintenance and custodial requirements. Costs also vary among schools depending on the amount of remodeling that is done by maintenance staff; in recent years, University of Minnesota workers have done relatively little remodeling. Third, the maintenance costs reported to APPA also depend on the age and condition of buildings at various universities. Finally, the maintenance and custodial costs of universities reflect widely varied labor markets. Some people told us that the University of Minnesota's higher costs reflect generally higher wages for Twin Cities maintenance and custodial workers.<sup>5</sup>

We took two steps to enable us to make more valid comparisons among the schools. Rather than comparing the University of Minnesota with all other universities in the U.S., we compared it with schools of a similar type, such as Midwestern research institutions and schools with more than 20,000 enrollment. In addition, we used medians rather than averages in our comparisons to reduce the effects of extremes in the cost reports submitted to APPA.

In the sections that follow, we discuss our cost and staffing findings in more detail, and we also review changes in organizational structure inside and outside of Physical Plant.

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<sup>4</sup> One Big 10 school mismatched its cost base with its area base. It reported costs for all properties maintained by its physical plant (regardless of which budgets paid for this maintenance) but reported square footage only for areas charged to the physical plant budget. This resulted in an overreporting of costs per square foot. In addition, APPA requests universities to include employee fringe benefits in reported costs, but it is possible that some universities pay fringe benefits from other budgets and do not follow APPA's instructions.

<sup>5</sup> A 1990 survey by the Building Owners and Managers Association International reported that average office cleaning costs in the Twin Cities area were 50 percent higher than costs elsewhere in the U.S. and Canada (BOMA, *Office Building Cleaning Operations in North America*, (Washington, D.C., 1990)). The report also noted that custodial costs were higher in downtown versus suburban areas, and in buildings with high occupancy levels.

## Maintenance Costs and Staffing

As shown in Figure 1, maintenance staffing has increased since our 1988 report. Much of the increase has resulted from an increase in remodeling work (Physical Plant was doing virtually no remodeling in 1988) and special University funding for maintenance work designed to improve energy efficiency. Physical Plant maintenance staffing reached a four-year high in 1990.<sup>6</sup> Most of Physical Plant's shop workers are journeyman trades workers. As of Spring 1991, the shops employed only seven student workers and ten apprentices.

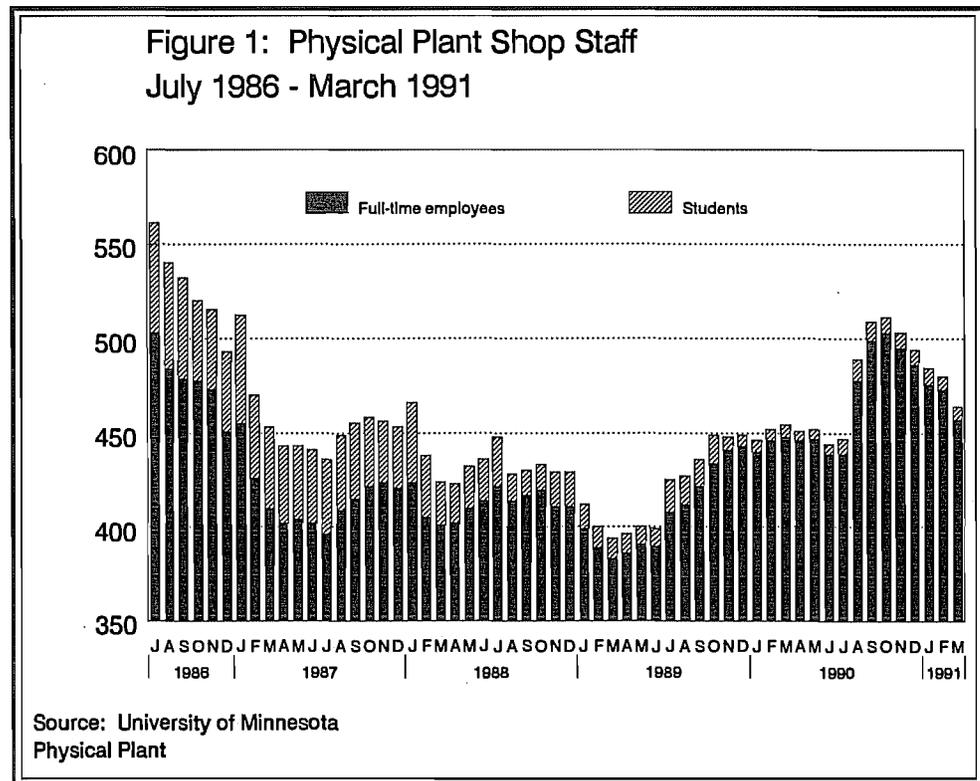


Table 1 compares the University of Minnesota's 1989-90 building and maintenance costs and staff size with other large public universities.<sup>7</sup> Table 1 shows that:

- **In 1989-90, Minnesota had more maintenance workers and higher maintenance costs per square foot than other research schools and schools with high enrollment.**

<sup>6</sup> In late 1989, management began requiring shops to complete requisitions prior to adding staff. These requisitions must be approved by management and were intended to increase accountability for staffing.

<sup>7</sup> Although there are more schools in the above 20,000 enrollment category, we feel that the Midwest research institutions are a better comparison group for several reasons. First, large research institutions tend to have more specialized equipment with special maintenance needs. Second, the cost of living varies in different regions of the country. Third, all but one of the Midwest institutions are unionized but only 60 percent of the institutions with over 20,000 students are. Typically, union salaries are \$3,000 to \$4,000 per year higher than non-union salaries.

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**Table 1: Maintenance Staff and Costs Per Square Foot for Large Universities, 1989-90**

	<u>Annual Costs Per Square Foot</u>	<u>Full Time Employees Per Million Square Feet</u>
University of Minnesota	\$1.13	36.7
Midwest Research Schools (Median of 12 institutions)	\$ .85	21.1
Schools > 20,000 Enrollment (Median of 50 institutions)	\$ .75	24.3

Note: Data are for public institutions only.

Source: Association of Physical Plant Administrators of Universities and Colleges, *1989-90 Comparative Costs and Staffing Report for College and University Facilities* (Alexandria, VA, 1990); University of Minnesota Physical Plant.

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Minnesota's costs were approximately one-third higher than other Midwest research institutions and 50 percent higher than other large institutions around the country.

APPA also surveyed median starting salaries for maintenance workers and we summarize these results in Table 2. The table shows that the University of Minnesota's trades salaries are well above those of comparable institutions. Depending on the trade, Minnesota's starting salaries exceeded the median salaries of other schools with over 20,000 enrollment by 42 to 63 percent.

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**Table 2: Median Starting Salaries for Trades Workers, 1989-90**

	<u>University of Minnesota</u>	<u>Other Research Schools (Midwest)</u>	<u>Schools &gt; 20,000 Enrollment</u>
Electrician	\$40,215	\$28,044	\$24,603
Plumber	35,099	28,392	24,755
Carpenter	37,083	26,880	22,886
Painter	33,721	26,158	22,317
General Maintenance	19,524	16,598	17,822

Note: Figures exclude fringe benefits. Data are for public institutions only. University of Minnesota salaries are based on a prorated average of 1989 and 1990 contract rates.

Source: Association of Physical Plant Administrators of Universities and Colleges, *1989-90 Comparative Costs and Staffing Report for College and University Facilities* (Alexandria, VA, 1990); University of Minnesota salaries are based on data provided to the Program Evaluation Division by Physical Plant staff.

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Minnesota's trade salaries exceeded those of other Midwest research institutions by 24 to 43 percent. Salary differences were smaller for general maintenance mechanics.<sup>8</sup>

In summary, Minnesota's building maintenance costs remain above those of comparable institutions, both because of higher annual salaries for trades workers and because Minnesota employs more building maintenance workers per square foot.

## Custodial Costs and Staffing

Table 3 compares Minnesota's 1989-90 custodial salaries, staff size, and costs with those of comparable schools. We found that:

- Minnesota's custodial costs of \$1.03 per square foot were 39 percent higher than other Midwest research institutions and 45 percent higher than schools with over 20,000 enrollment.<sup>9</sup>

**Table 3: Custodial Costs, Staff Size and Starting Salaries for Large Universities, 1989-90**

	Annual Costs Per Square Foot	Full Time Employees Per Million Square Feet	Starting Salary <sup>a</sup>
University of Minnesota	\$1.03	36.3 <sup>b</sup>	\$15,036
Midwest Research Schools <sup>c</sup> (Median of 12 institutions)	.74	39.3	14,000
Schools > 20,000 Enrollment <sup>c</sup> (Median of 50 institutions)	.71	38.5	12,650

<sup>a</sup>Median salary excluding fringe benefits.

<sup>b</sup>Based upon average monthly FY 1990 FTE custodial staff of 474.3.

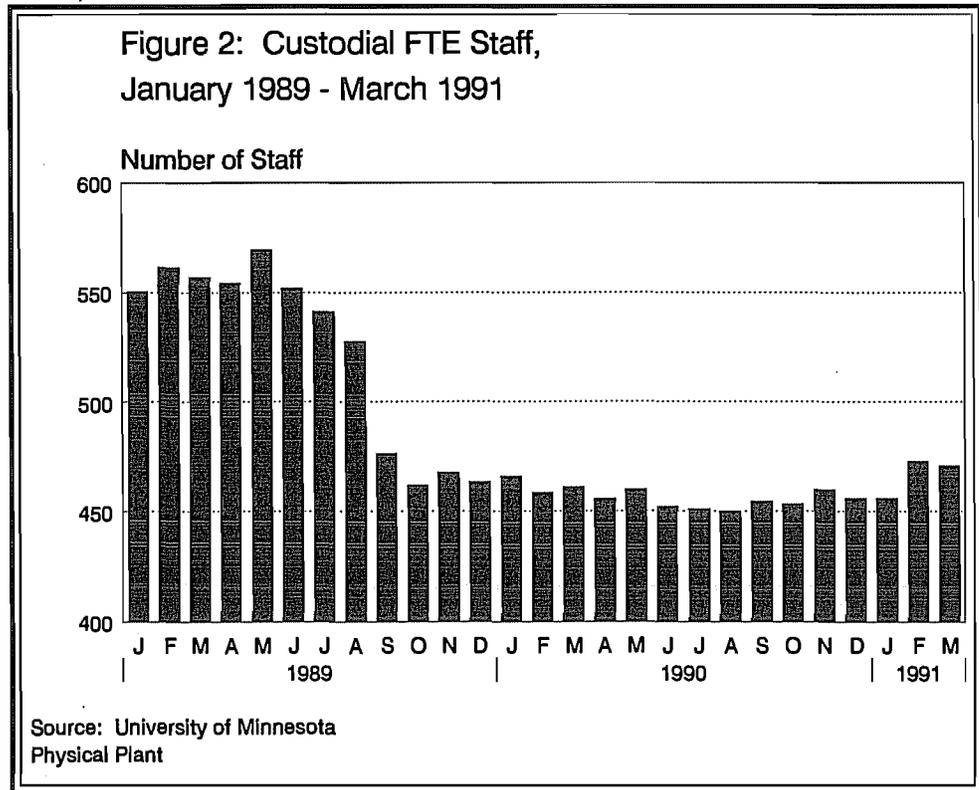
<sup>c</sup>Data are for public institutions only.

Source: Association of Physical Plant Administrators of Universities and Colleges, *1989-90 Comparative Costs and Staffing Report for College and University Facilities* (Alexandria, VA, 1990); University of Minnesota Physical Plant.

Table 3 shows that Minnesota actually employed fewer custodians per square foot than the comparable schools. In fact, as Figure 2 shows, custodial staffing has declined since 1988 due to budget cuts in September 1989.

<sup>8</sup> The salaries in Table 2 exclude fringe benefits. Depending on their trade, Physical Plant maintenance workers receive an additional 28 to 42 percent of their salary in fringe benefits, including social security, retirement pension, workers compensation, unemployment insurance, health and dental insurance, and other special benefits. Non-trades Physical Plant workers receive a fringe benefit package equal to 24.5 percent of their salary. The average fringe benefit rate reported by APPA for Midwest research institutions is 24.4 percent. Thus, the percentage difference in *total* compensation between University Physical Plant maintenance workers and those of comparable universities was even greater than the percentages for salaries discussed above.

<sup>9</sup> Physical Plant managers told us that they followed APPA instructions and reported budgeted costs, not actual costs. Physical Plant's actual costs for 1989-90 were \$0.99 per square foot, slightly lower than budgeted costs. We do not know if other schools had differences between budgeted and actual costs.



Salaries account for the vast majority of custodial costs and, therefore, probably account for the higher costs per square foot. Table 3 shows that Minnesota's starting custodial salaries were 7 percent above other Midwest research institutions and 19 percent above other schools with enrollments over 20,000. However, Physical Plant managers claim that the APPA data understates actual salary differences because a high proportion of custodians have been with Physical Plant for many years and earn considerably above the starting rate. Excluding part-time students and supervisors, the average Physical Plant custodial salary in July 1989 was \$22,321, according to Physical Plant staff.<sup>10</sup> The APPA data does not report average salaries (as opposed to starting salaries) at universities, nor does it report the average tenure of various schools' custodial staff.

We used a May 1990 employer salary survey by the DCA Stanton Group to compare average salaries of University of Minnesota custodians with those of custodians at public agencies and a sample of private companies in the Twin Cities.<sup>11</sup> Table 4 presents the results of the survey. We determined that Physical Plant's custodians receive hourly wages that are, on average, about five percent higher than those of employees at the other public agencies shown. The table does not reflect the wages paid by private contractors, who provide custodial services for some of the public agencies shown.

<sup>10</sup> The May 1990 DCA Stanton survey discussed below and presented in Table 4 reports an average Physical Plant custodial salary of \$22,008.

<sup>11</sup> The Stanton survey does not contain comparative salary data on trades workers.

**Table 4: Average Custodial Salaries for Twin Cities Metropolitan Area Employers**

<u>Agency</u>	<u>Number of Positions<sup>a</sup></u>	<u>Average Hourly Rate<sup>a</sup></u>
University of Minnesota	513	\$10.54
State of Minnesota	776	10.12
Hennepin County	99	9.65
Ramsey County	26	10.21
Other Large Counties <sup>b</sup>	57	8.82
City of Minneapolis	11	12.24
Suburbs > 10,000	31	10.44
All Metro Governments <sup>c</sup>	1,536	10.22
Federal Agencies		8.18-10.17
34 Private Companies		9.63

Source: DCA Stanton Group, *1990 Twin Cities Metropolitan Area Salary Survey* (Minnetonka, MN, 1990).

<sup>a</sup>In-house staff only--excludes contracted services.

<sup>b</sup>Anoka, Dakota, Olmsted, St. Louis, Scott, Washington.

<sup>c</sup>Also includes metropolitan agencies and smaller suburbs.

Typically, the wages of custodians employed by private companies are lower than those paid by public agencies. Table 4 shows that Physical Plant's average wages are nearly 10 percent higher than those paid to custodians employed by the private companies surveyed by DCA Stanton. To determine the average wages paid to workers employed by independent custodial contractors, we contacted a major Twin Cities office cleaning contractor and the union that serves most custodians employed by Twin Cities contractors. They reported that full-time custodians employed for at least six months earn a minimum of \$6.76 per hour (\$14,060 per year). Employers have the option of paying higher wages to contract workers who perform well and are dependable, but we did not obtain information on the actual average salaries paid.

In summary, the University of Minnesota's custodial costs are significantly higher than those of comparable institutions, which reflects higher salaries but not higher staffing levels. Minnesota's **starting** salaries are higher than most comparable universities, but there is insufficient existing data to compare **average** salaries among universities. Physical Plant's average salaries appear to be 5 to 10 percent higher than the average salaries paid to custodians by Twin Cities public and private employers, and perhaps higher still than typical salaries paid by independent custodial contractors. The University should carefully consider these disparities as it negotiates a contract with the Teamsters in 1991.

## Physical Plant Organization

Our 1988 study found that Physical Plant's organizational structure (summarized in Figure 3) was "awkward and makes effective management difficult." Within the University's organization, Physical Plant reported to the Vice President for Academic Affairs, who also served as Provost for the Twin Cities campus. This vice president's academic responsibilities were extensive and left little time for attention to Physical Plant issues. The reporting relationships within Physical Plant were also deficient. There were too many managers reporting to Physical Plant's director, including five shop managers. The director had little confidence in his associate director and, therefore, gave him few management duties. The Associate Provost for Physical Plant played a very active role in the department's management, overshadowing the Physical Plant director's role and confusing lines of accountability.<sup>12</sup> Top management made frequent organization changes, sometimes without consulting key staff. Finally, management hired seven "area managers" to improve shop oversight, but without adequately clarifying these managers' responsibilities and coordinating their work. These organizational problems hurt management's credibility with employees.

We have reexamined Physical Plant's organizational structure and found that:

- **Since 1988, Physical Plant's formal internal and external reporting relationships have become more clear and logical.**

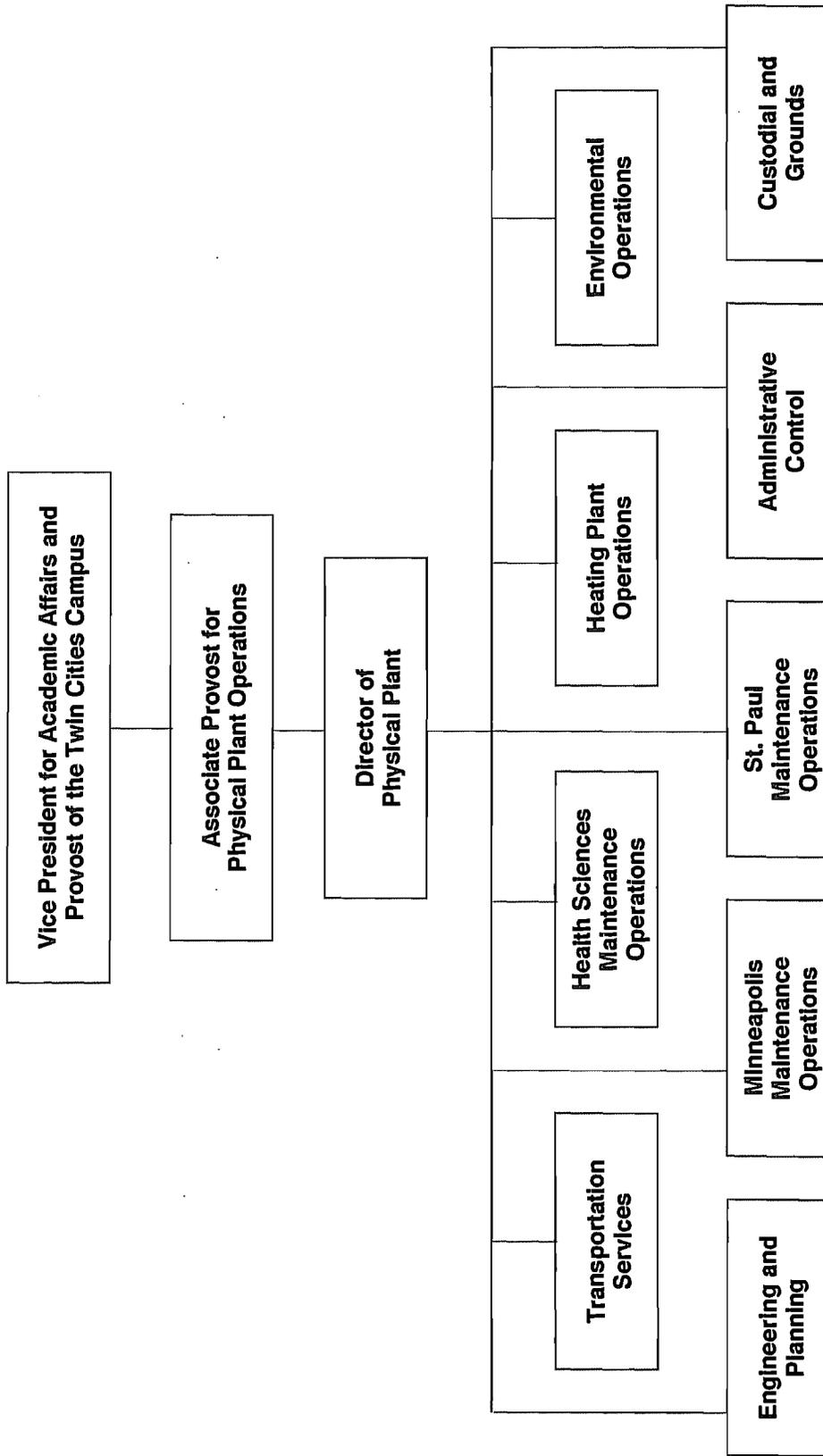
Soon after the release of our original report, University administrators transferred responsibility for Physical Plant from the Vice President for Academic Affairs to the Senior Vice President for Finance and Operations. In 1989, management laid off the area managers and chose not to renew the associate director's contract. By early 1990, the number of managers reporting to the director of Physical Plant had been reduced from nine to six.

During the past three years, the process of improving Physical Plant's organizational structure and effectiveness has been tied closely to personnel changes in key positions. We discussed some of the important top management changes in the Introduction, and there have been many other changes. For example, in the months after the new Physical Plant director--now called Assistant Vice President for Physical Plant--was hired in April 1990, she restructured her management team. Two top managers were transferred to another University department, and the position of "chief financial officer" was created. We think these personnel changes have enabled Physical Plant to have a more cohesive management team that seems to be working toward common goals. At the same time, the process of "getting the right people" in management positions has consumed considerable time and energy during the past three years. Most of the recently-hired Physical Plant managers have been new to the University, so it has taken time for them to learn about Physical Plant and the University campus.

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<sup>12</sup> In fact, one of Physical Plant's division directors reported directly to the Associate Provost.

Figure 3: August 1988 Organization of Physical Plant



Now that Physical Plant has its management team in place, the key challenge will be making the proposed organization work effectively. Of the many reorganizations in Physical Plant's recent history, this one is the most significant. The changes are designed to provide more responsive customer services, reduce the cost of transporting workers to job sites, and encourage stronger accountability for maintenance costs in individual buildings. In a broad sense, we think Physical Plant management has conceived a reasonable plan for achieving these objectives.

Ultimately, however, the reorganization must stand the test of implementation, and this will present many challenges. For example, it remains to be seen how effectively one supervisor for a geographic area can manage workers from a variety of trades, as well as custodians. This approach has been used in other organizations, but its success at the University will depend largely on the abilities of the individuals who will be selected in 1991 for more than 40 restructured supervisory positions. Also, the reorganization will require employees to work with many new supervisors, co-workers, and customers. In addition, Physical Plant zone staff intend to assign priorities to customer requests for maintenance work, and the deferral of projects with low priority will probably result in some tensions between Physical Plant and departments. In sum, there are numerous things that could go wrong during implementation of this reorganization, and some probably will. Management will succeed if it can minimize implementation mistakes, retain credibility with employees and customers, and emerge with an organizational structure that provides better service at lower costs.

## COMMUNICATIONS

Our 1988 evaluation revealed significant communication problems at Physical Plant. Internally, there was a poor working relationship between the Physical Plant director and his top management staff. The management team rarely met, and the director did not always consult his managers on important actions. The Associate Provost for Physical Plant sent regular letters to employees, but the director was not very visible. Many employees did not think that management was willing to listen to their concerns. Reorganization plans were developed without input from key managers, and they were poorly communicated to workers. Many employees said that their supervisors did not effectively communicate expectations or provide feedback on work.

Physical Plant also had poor relations with other University organizations, such as the Board of Regents, Department of Environmental Health and Safety, and Office of Physical Planning. Of particular concern, the Regents distrusted Physical Plant administrators and sometimes bypassed them to obtain information.

## Internal Communication

- **There is encouraging evidence that communications within Physical Plant have improved since our 1988 report, but there remains much room for improvement.**

The management team now meets regularly (three times a week), and seems to be more cohesive than it was previously. The team has used Physical Plant's training and organizational development specialist to observe its meetings and facilitate discussions. This specialist also devoted the only supervisory training course offered internally at Physical Plant in 1990 to the topic of communications. We talked to many participants in the course, and they rated it highly. During the past year, management also initiated monthly shop foremen's meetings and biweekly employee safety meetings in each shop. A key supervisor who rarely met with his employees was replaced by management.

Management's success in communicating with employees about the proposed reorganization has been mixed. On the positive side, the management team called a general meeting of employees in February 1990 to announce the reorganization and solicit comments. Management distributed a written questionnaire that invited employees to submit comments or questions on the proposals, promising responses within a month's time.<sup>13</sup> Many employees we talked to cited this as an indication that present management is more open and willing to listen to employees than previous Physical Plant managers.<sup>14</sup> On the other hand, management decided to announce the reorganization proposal before most of the details had been worked out, so it was unable to answer many of the questions asked. This has engendered serious distrust and resentment among some employees, while others have adopted a "wait and see" attitude toward the changes. The strongest resentment is among custodial supervisors, who learned at the February meeting that they would be losing their existing jobs. Although management encouraged them to apply for new supervisory positions being created, position descriptions for the restructured jobs were not available until more than two months after the reorganization was announced.

The present management team has been more visible with employees than some previous managers have been. Top managers have taken the time to visit shops and facilities, attend trades meetings, and respond individually to questions. Physical Plant managers have expressed an interest in establishing employee teams that could look for ways to improve service delivery.<sup>15</sup> To date, management has established only one such team, which developed useful recommendations for improving shop tickets and work scheduling.<sup>16</sup>

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<sup>13</sup> Management told us they responded to all employees who signed their names to questionnaires.

<sup>14</sup> Some employees told us that having such a large meeting to announce the reorganization discouraged effective discussion between management and employees.

<sup>15</sup> Some organizations refer to such teams as "quality circles" or to the general approach as "total quality management."

<sup>16</sup> Physical Plant employees are also among the participants in a campuswide review of remodeling services, initiated by University administrators at Physical Plant's request.

Management intends to establish "implementation planning committees," consisting of management, employees, and customer representatives, in each of the zones. Also, the 1990 trades contract requires that labor-management committees be established "to allow management and labor to exchange ideas and suggestions on matters such as scheduling, providing timely service, training, second injury registration, workers compensation, and other matters of mutual concern." Management intends to establish labor-management committees in each zone.

## External Communication

- ⊙ **Physical Plant management has, with considerable success, given high priority to improving its relations with external groups, such as the Board of Regents, University departments, and organized labor.**

We talked to key Regents and observed management's March presentation of its reorganization to the Regents. The Regents have been complimentary of management's commitment to making changes, its openness, and its reorganization plan. Regents have requested that management provide them with periodic progress reports and performance indicators, but they have generally been comfortable with the types of changes that management has proposed. Also, we heard of no recent allegations that Regents have "meddled" in management issues, which we cited as a problem in 1988.

We also talked to representatives of the University faculty and departments. They said that departments have been and continue to be frustrated by Physical Plant's costs and service levels, and they support the organizational changes being proposed.<sup>17</sup> Some faculty would have preferred more involvement in Physical Plant's reorganization planning, but they view management as open to working with them in the future.

We found that Physical Plant's relationship with the University's Department of Environmental Health and Safety (DEHS) has improved markedly. One reason is that Physical Plant hired its first safety officer in June 1990, and he has been developing a comprehensive safety program. The program includes biweekly safety meetings conducted by each supervisor, a Physical Plant safety manual (now in draft form), training programs for all supervisors (to be completed this summer) and all employees (to be completed by January 1992), and periodic safety audits (starting in 1992). Previously, Physical Plant had a largely ineffective safety committee, and DEHS had difficulty getting Physical Plant staff to implement needed changes. A second reason for the improved relationship between the two departments is that responsibility for hazardous waste handling has been transferred from Physical Plant to DEHS. Thus, the department that sets safety procedures for hazardous waste now is also responsible for hazardous waste handling.

In addition, we found that Physical Plant management has worked closely with organized labor. Labor representatives we talked with said that their

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<sup>17</sup> Departments pay for the costs of "nonroutine" maintenance work from their own budgets. Physical Plant's budget pays for the cost of routine maintenance and custodial work.

communications with current managers are more open than they were in the past. In the case of the building trades, the Assistant Vice President for Physical Plant has worked primarily with the trades umbrella organization rather than with each individual local. Although some of the locals' business agents have expressed a desire to be consulted more often, we think it is reasonable for management to deal mainly with the umbrella organization.

Finally, we examined the relationship between Physical Plant and the University's Office of Physical Planning. For each of the University's campuses, Physical Planning oversees construction projects, the design and use of buildings, and campus land uses. We found that:

- **The relationship between Physical Plant and Physical Planning is not as strained as it was in 1988, but there needs to be more communication between these departments and a clearer definition of each department's role.**

In 1988, the two departments disagreed on the appropriate roles that each should play in the process of remodeling University space. These roles were clarified by a written agreement between the directors of the two departments in February 1990.<sup>18</sup>

While this important issue appears to have been resolved, others need to be addressed. For example, in 1988, Physical Plant staff told us that their views were not adequately considered in the design of new buildings. They felt that the University was constructing buildings that were difficult or expensive to maintain. However, we also reported that Physical Planning had taken actions in 1988 to better inform Physical Plant of upcoming construction projects or revisions of design standards. Today, Physical Plant's new management team has expressed concerns identical to the ones we heard earlier. Physical Planning staff insist that Physical Plant is given ample opportunities for input into construction decisions, but often does not participate actively.<sup>19</sup>

A more fundamental issue is the overlap of Physical Plant and Physical Planning functions. Physical Plant management has renamed its organization "Facilities Management," reflecting its goal of managing building investments on the Twin Cities campus rather than simply providing custodial and repair services to buildings. For example, one of the principles articulated by Physical Plant management in their 1991 reorganization proposal is that "major capital improvements should not be made to underutilized and operationally inefficient space." However, this seems a more appropriate principle for

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<sup>18</sup> At the time of our 1988 study, the departments reported to two different vice presidents. Now, both report to the Senior Vice President for Finance and Operations.

<sup>19</sup> Physical Planning sends Physical Plant minutes of design meetings and planning documents for review and comment. Notice of construction activities also occurs when the Board of Regents approves projects. Physical Planning staff said they are willing to place Physical Plant staff on any committee to review building projects or construction standards. It is also worth noting that the Assistant Vice President for Physical Plant was recently appointed to the University's Space Advisory Committee, which should enable better representation of Physical Plant views on building use and construction.

Physical Planning, which is responsible for University space management and construction. We recommend that:

- **Physical Plant managers should discuss the "facilities management" approach with Physical Planning staff and reach a common understanding of departmental roles and responsibilities. As needed, the Senior Vice President for Finance and Operations should clarify the boundaries of the two departments or consolidate functions.**

## EMPLOYEE MORALE

In our 1988 study, we surveyed 400 Physical Plant employees to determine job satisfaction and employee morale. We found that Physical Plant employees expressed somewhat lower levels of job satisfaction than similar workers in other organizations, but most Physical Plant workers take pride in their work and appreciate the job security they have at the University. Both custodial and shop workers expressed relatively high levels of dissatisfaction with their direct supervisors.

The most striking finding from the 1988 survey was workers' concern about Physical Plant's overall work environment and top management. This was particularly evident among shop workers, 70 percent of whom said that Physical Plant was becoming a less satisfying place to work. We noted that the morale problems threatened management's ability to make needed organizational changes.

We have not conducted a follow-up employee survey. At the outset of this study, management had just informed employees about its reorganization proposals and was still working out many of the implementation details. Because employee sentiments seemed subject to change during the reorganization process, we felt that repeating a formal survey of employees at this time was not justified.

We did, however, make extensive efforts to solicit employee opinions on their jobs, the reorganization proposal, and morale. We posted notices throughout Physical Plant asking employees to contact us with their comments. In addition, we called and wrote to individual supervisors and union stewards in the shop and custodial operations. In all, we heard from about 60 employees. We also reviewed the questionnaires completed by employees in response to management's reorganization proposal. Overall, we found that:

- **The attitudes of employees vary widely, but many are reserving judgment until they know more about the organizational changes. Morale has declined among custodians and their supervisors because of both the substance of the reorganization proposals and the manner in which they have been made.**

Some employees told us that the proposed changes are long overdue, and that management should be given a chance to make the proposals work. Others said that morale is as low as it ever has been, and that they preferred the previous management team.

## Comments from Shop Workers

Although we heard from several shop employees who expressed anger at the proposed changes or said that morale is very low, most shop staff seem to be reserving judgment until they see how the proposals work in practice. Many staff think the present management team has been willing to listen to their concerns and is making sincere efforts to address problems. But employees also have some skepticism about whether the proposals will really change the way they do their work. The types of issues raised by shop staff include the following:

- Which shop functions will continue to be done centrally (rather than by the zone staff), and will management be willing to shift staff between zones if the workload demands it?
- Within each zone, who will order materials, answer technical questions, and deal with customers?
- Within each zone, will there be sufficient arrangements for emergencies that arise outside of normal work hours?
- Will the zone supervisors have the knowledge of individual staff abilities and maintenance techniques necessary to wisely schedule, budget, and advise employees?
- Will the new organization actually cost more than the existing one due to diseconomies of scale, such as needing certain equipment and staff in each zone?
- Who will assign staff to zones, and on what basis? Will the compatibility of staff personalities be more of an issue in zones, since employees will be doing more work in small teams?
- Will Physical Plant be able to find adequate space on its East Bank campus for the new zone shops?

Some foremen and workers told us that management is learning as it goes and should be given an opportunity to make things work. Others distrusted management and felt that management was trying to keep information from employees.

## Comments from Custodians

Custodial supervisors are more directly affected by the reorganization proposal than any other group of employees. Under the zone system, custodians will be directly supervised by "operations supervisors," who will also supervise trades employees in the zone. This means that present custodial supervisors will have to reapply for the restructured supervisory positions. In late April 1991, University personnel staff graded the operations supervisor positions as "A-11," compared to "A-5" for most current custodial supervisors. This means that the restructured positions have greater responsibility than the previous custodial supervisory positions. In late April, Physical Plant management decided that only existing University of Minnesota staff would be initially considered for the restructured positions.<sup>20</sup> Management guaranteed that Physical Plant employees affected by the reorganization would be interviewed, and it has offered the employees assistance in preparing for the interviews. Management told us that employees who could qualify for the new positions with some reasonable amount of supplemental training would be hired for them.

Obviously, present supervisors are concerned about the uncertainty surrounding their jobs. When we talked to supervisors, most were under the mistaken impression that the restructured supervisory jobs would not be significantly different from their existing jobs. Thus, they resented having to apply for the restructured positions, or feared that the reorganization was just a way to get rid of existing supervisors. They also wondered why management did not have position descriptions available when the reorganization was announced in February, and several told us that management was callous in a meeting with the affected supervisors. Many of the supervisors are long-time University employees and felt they were not treated with respect under the reorganization.

Non-supervisory custodians told us that there continue to be some problems with supervision, consistent with findings in our 1988 employee survey. These problems include infrequent inspections and poor communication skills. But both employees and supervisors expressed concerns about bringing in new supervisors who are not familiar with University customers or the specialized cleaning requirements of certain parts of campus. They questioned whether the reorganization will result in better service.

Many custodial staff we talked with think that having shop workers and custodians under a single supervisor could have some beneficial effects. Custodians have sometimes been frustrated by the time it takes to get shops to make building or equipment repairs, and they think that the zone system might improve the working relationship between shop and custodial staff.

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<sup>20</sup> In addition to Physical Plant employees, staff from other University campuses and staff who work in departments other than Physical Plant will be considered for the positions.

## CUSTOMER VIEWS OF PHYSICAL PLANT SERVICES

As a support organization within the University, Physical Plant must ultimately be judged by the service it provides to its customers. In our 1988 study, we conducted a very limited evaluation of customer satisfaction, surveying University departments about a small sample of shop projects and custodial work areas. We heard relatively few complaints about the quality of services provided, although some departments expressed concerns about the costs of maintenance work or about the failure of Physical Plant to provide preliminary cost estimates.

In 1989, an internal University task force on Twin Cities campus support and service units conducted a more extensive survey on Physical Plant.<sup>21</sup> That survey of 152 deans, program directors, and department heads found that 44 percent rated Physical Plant's overall service as "good" or "excellent," 43 percent as "average," and 14 percent as "poor" or "terrible." The key areas of concern were costs, custodial services, temperature control, and maintenance of building interiors (such as painting). For example, 68 percent of respondents described Physical Plant costs as "poor" or "terrible," and only 28 percent of respondents expressed satisfaction with custodial services.<sup>22</sup>

Physical Plant's custodial managers have regularly surveyed University users about satisfaction with custodial services. Each year, about 10,000 surveys are distributed throughout campus for any building users to complete, and these surveys have usually showed high satisfaction levels. For example, in 1990, Physical Plant staff found that, based on about 2,700 completed surveys, 87 percent of campus buildings were being maintained at levels satisfactory to users.<sup>23</sup>

One of the primary goals of Physical Plant's new management team has been improved customer service. We thought it would be useful to document current levels of customer satisfaction. As the University task force did in 1989, we decided to survey those people with administrative responsibility for

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21 Task Force for Review of Twin Cities Campus Support and Service Units, *Serving the University of Minnesota's Academic Mission: A Review of Twin Cities Campus Support and Service Units* (Minneapolis: May 1989).

22 Another 24 percent of respondents described Physical Plant costs as "average," and 7 percent said costs were "good" or "excellent." Regarding custodial services, 45 percent of respondents were "dissatisfied" or "very dissatisfied," and 27 percent were neutral.

23 The survey does not ask respondents for a single overall rating of custodial service levels. Rather, it asks respondents to separately rate service to various types of rooms (such as offices, labs, and public areas), as well as rating custodial friendliness, responsiveness, and building security. To determine whether users of a particular building were satisfied with their service, Physical Plant determined whether the respondents' average response to a question on the surveys exceeded 3.0 on a five-point scale. There is no particular quality control with this survey, such as ensuring that the same people do not complete multiple copies of the survey, and it is unclear what mix of students, administrators, faculty, and other users responded.

departments and programs at the University. We relied on these people (or their designees) to speak on behalf of their University units.<sup>24</sup> About 75 percent of the surveyed administrators responded to our survey and follow-up letter in April and May 1991. We asked respondents to base their answers on experience with Physical Plant in the previous 12 months.

## Maintenance Survey Findings

Our survey asked University deans, directors and department heads whether Physical Plant performs high quality work, is timely and efficient, charges reasonable rates, and relates well to customers. Table 5 presents the survey results on maintenance work.<sup>25</sup> In general, we found that:

- ⊙ **Customers believe that Physical Plant's shops do high quality work and are responsive to their needs, but they also think the work is too costly and inefficient.**

Table 5 indicates that 73 percent of the respondents said that Physical Plant staff "often," "usually," or "always" perform high quality maintenance work and 71 percent said that Physical Plant responds to service requests in a timely manner. Most customers said that cost estimates are provided when requested and about two-thirds of the respondents felt that most estimates are reasonably close to actual costs. However, less than one-fifth of the respondents felt that the costs for services were reasonable, and less than half felt that maintenance staff are productive and efficient. Overall, 46 percent of respondents were either satisfied or very satisfied with Physical Plant's maintenance services, 28 percent were neutral, and 26 percent were either dissatisfied or very dissatisfied.

Our questionnaire provided an opportunity for customers to express themselves in greater depth by listing positive comments about Physical Plant and areas where they think Physical Plant needs to improve. We did not try to verify the opinions expressed by individual customers. However, three-fourths of the survey respondents told us that they (or people they supervise) have responsibility for Physical Plant issues within their academic units, and two-thirds described themselves as "very" or "mostly" familiar with Physical Plant. We think the opinions and perceptions of these staff deserve mention.

Figure 4 summarizes the most common comments that relate to maintenance work.<sup>26</sup> Positive comments centered around Physical Plant's good or

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<sup>24</sup> We used a standard University mailing list of deans, directors, and department heads, which also includes their assistants. Of the 438 surveys originally sent, 33 respondents told us they did not wish to complete the survey, typically because Physical Plant did not clean or maintain their space. For purposes of determining the survey response rate, we excluded these respondents from our sample universe.

<sup>25</sup> Complete summaries of all survey items are contained in the Appendix.

<sup>26</sup> The lists in Figure 4 give a general indication of customer sentiments, although it is sometimes difficult to tabulate and draw inferences from responses to open-ended questions. Many respondents listed both positive and negative comments, and others chose not to comment at all. The open-ended questions seemed to elicit more negative feelings from customers than positive.

**Table 5: Customer Opinions on Physical Plant's Maintenance Service**

<u>Statement</u>	<u>Percent Who Responded:</u>	
	<u>"Never," "Rarely," or "Sometimes"</u>	<u>"Often," "Usually," or "Always"</u>
Physical Plant staff perform high quality maintenance work.	27%	73%
When we call Physical Plant with a problem or request, staff respond in a reasonable amount of time.	29	71
Physical Plant staff are available to answer our questions about maintenance work.	32	68
For projects that will be charged against our budget, Physical Plant staff provide us with cost estimates when we request them.	18	82
The actual cost of work done by Physical Plant is reasonably close to the estimates we receive.	35	65
The costs billed to us for Physical Plant's maintenance services are reasonable.	81	19
Physical Plant maintenance staff have a "customer orientation" and try to keep us satisfied.	48	52
Physical Plant maintenance staff are productive and efficient.	55	45
Physical Plant maintenance staff do their work with a minimum of disruption to our work.	23	77

Note: Based on 303 completed surveys. Percentages exclude "don't know" responses and those who did not respond.

**Figure 4: Most Common Customer Comments About Building Maintenance**

Positive Comments:

- Physical Plant is responsive (or becoming more responsive) to requests.
- Physical Plant staff do high quality work.
- Communications or customer relations is good or has improved.

Negative Comments:

- Costs are high--services are overpriced.
- Building temperature control is poor.
- Service is too slow.
- Work quality is poor.

Note: The comments are listed in descending order of frequency. We show only the comments that ten or more customers made.

Source: Program Evaluation Division survey, April-May 1991.

improved customer relations and its high quality work. The following comments typify this feeling:

Staff in the Health Science Physical Plant office are very helpful and responsive to our needs. They are very courteous and friendly at all times. When there is an emergency, they follow up immediately and send the proper maintenance personnel.

Quality of work from most shops is excellent. Response to emergencies is very good.

Some very competent and dedicated career employees have served consistently with distinction. They should be recognized and rewarded for their example.

However, we also heard many negative comments, including some complaints about work quality and slow response times. The customers' chief concern was the high cost of Physical Plant work, and several respondents said that private sector contractors charge much less for remodeling. Many customers expressed frustration with the general conditions of buildings, but particularly with inadequate temperature control systems and Physical Plant's inability to correct these problems. The following are examples of concerns expressed by customers:

The costs of routine work are outrageous. As a person who often hires contractors to work on my own home, I am absolutely dismayed that a simple job such as installing a shelf or moving heavy items can cost so much. It's an outrage.

Get the prices of work in line with actual services provided by outside vendors or let departments contract with other vendors.

In a major remodeling effort in our building, costs were excessive, they did not complete work on schedule, workers arrived late, left early, took long lunches and breaks, and generally did a great deal of goofing off.

Unions are featherbedding. Replacing a broken sash cord would require the carpenter shop, air conditioning shop (to remove air conditioner) and sheet metal shop to remove a bracket which is already fabricated. Why can't a carpenter undo six screws?

We have been trying to get our air conditioning to work for two years. People are always working on it but so far there are no results. Our office is too hot and we have no control.

We freeze in the fall but the heat goes on and we swelter into May before the heat is turned off.

Most respondents (79 percent) said their level of satisfaction with maintenance service had not changed during the past year. Fifteen percent of customers said they had become more satisfied, and six percent had become less satisfied.

## Custodial Survey Findings

Table 6 presents customer survey results for custodial service. We found that:

- **There is considerable dissatisfaction with custodial services.**

Only 36 percent of respondents were "satisfied" or "very satisfied" with Physical Plant's overall custodial service, 24 percent were "neutral," and 40 percent were either "dissatisfied" or "very dissatisfied."<sup>27</sup>

Only 33 percent of respondents said that Physical Plant "often," "usually," or "always" provides a reasonable level of custodial service, and only 43 percent thought that custodial staff are productive and efficient. About half of the respondents said that custodial staff were customer-oriented and available to answer questions. Nearly two-thirds of the respondents said that custodians

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**Table 6: Customer Opinions on Physical Plant's Custodial Service**

<u>Statement</u>	<u>Percent Who Responded:</u>	
	<u>"Never," "Rarely," or "Sometimes"</u>	<u>"Often," "Usually," or "Always"</u>
Our space is cleaned as frequently and thoroughly as we think necessary and reasonable.	67%	33%
When we make special requests of Physical Plant's custodians, they are able to accommodate our needs.	35	65
Physical Plant staff are available to answer our questions about custodial work.	47	53
Physical Plant custodial staff have a "customer orientation" and try to keep us satisfied.	47	53
Physical Plant custodial staff are productive and efficient.	57	43
Physical Plant custodial staff do their work with a minimum of disruption to our work.	13	87

Note: Based on 303 completed surveys. Percentages exclude "don't know" responses and those who did not respond.

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<sup>27</sup> Although differences were not statistically significant, satisfaction with custodial service was greater in the Health Sciences complex and on the West Bank of the Minneapolis campus. Forty-nine percent of the Health Sciences respondents and 46 percent of the West Bank respondents were satisfied or very satisfied with custodial service, versus 26 percent of St. Paul campus respondents and 31 percent of Minneapolis East Bank campus respondents. The satisfaction levels were about the same for all types of space (classroom, office, restrooms, and labs).

were able to accommodate special requests, and 87 percent said that custodians were not disruptive. Most respondents (69 percent) said their level of satisfaction with custodial service had not changed during the past year. Eleven percent had become more satisfied and 20 percent had become less satisfied.

Figure 5 summarizes customer comments about custodial service. Most of the comments reflected customers' beliefs that space is not adequately cleaned.<sup>28</sup>

### Figure 5: Most Common Customer Comments about Custodial Service

#### Positive Comments:

- Custodians are friendly or cooperative.
- Custodians work hard or do good work.

#### Negative Comments:

- Service is inadequate--space is not kept clean.
- Custodians are poorly supervised.

Note: The comments are listed in descending order of frequency. We show only the comments that ten or more customers made.

Source: Program Evaluation Division survey, April-May 1991.

Many customers said that carpets are not vacuumed enough, restrooms and hallways are dirty, and there is rarely any dusting or cleaning of offices other than emptying waste baskets. Some customers commended their building custodians for working hard but said that staffing is insufficient to do an adequate job. Others commented on inadequate supervision of custodians, noting that no one seemed to check on the quantity and quality of work done. The following comments illustrate these concerns:

The building is filthy. Floors are not adequately cleaned. The floor in our office has not been cleaned yet this year. We've given up complaining. It has done no good.

The women's bathroom on the seventh floor has an accumulation of soap buildup on the walls and floor near the sinks that has been there for quite some time. The other bathrooms in the building are also a disgrace. Light bulbs are burned out, dirty paper towels are strewn all over the place, and soap dispensers do not dispense soap, which is extremely frustrating. The stairway of the building is also extremely filthy. There is always a collection of thick dust, cigarette butts, and miscellaneous debris.... The floors and walls of the passenger elevators are also remarkably dirty. The light fixtures in the elevators are covered with a coating of dirt, dust, and grime, as they have not been cleaned since the building was opened.

<sup>28</sup> About one-third of all survey respondents wrote us comments about inadequate custodial service.

The only things our custodians care about are empty garbage cans. They never vacuum unless we beg. Surfaces never get cleaned. Our building is filthy. It's an embarrassment to bring the public into offices and meeting areas.

We have been blessed with an exceptionally good group of custodians over the last 10-15 years. They keep getting stretched too far but they are good people.

Custodians don't have enough time to do all that needs to be done. They work hard but can't clean floors or dust as they are supposed to.

The custodial crew in my building lack supervision and an adequate understanding of quality control. The only task that appears to be routine is dumping waste baskets. I work late many evenings and seldom see the staff. Supervisors should verify time cards and know where and what their crew is doing.

The custodial department has many workers who care about the work they do and do more than their share. Custodial also has more than its share of people who do very little work but for some reason have no problem keeping their jobs here.

Overall, it is apparent that customers want better custodial service than they presently receive. Physical Plant reduced its custodial staff by nearly 20 percent in late 1989, resulting in reductions in service levels such as those shown in Figure 6. Thus, staffing and funding probably account for some of the dissatisfaction. However, the results of the University's 1989 internal survey of department heads indicate that dissatisfaction with custodial services predates the 1989 custodial staff reductions. Many customers also seem to think that better supervision and worker efficiency could improve service levels.

## SHOPS MANAGEMENT

The primary focus of our 1988 evaluation was Physical Plant's shop operations. We emphasized the shops because of their apparent problems with work planning, cost-effectiveness, work assignment, information systems, preventive maintenance, and worker transportation. This section updates our earlier findings on several key issues.

### Work Planning and Scheduling

According to a manual for university physical plant administrators, "probably no other function characterizes the modern approach to maintenance better, or has had a greater impact on the improved efficiency and effectiveness of maintenance activity, than that of work planning and scheduling..."<sup>29</sup> In 1988,

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<sup>29</sup> David R. Howard, "Overview of Maintenance Management," *Facilities Management: A Manual for Plant Administration*, ed. Teresa Burnau Evans (Washington, D.C.: APPA, 1984), III-7.

**Figure 6: Custodial Service Levels for University Classrooms Before and After September 1989**

<u>Item</u>	<u>Frequency Before September 1989</u>	<u>Frequency Since September 1989</u>
Sweep or vacuum floors	Daily	Weekly
Spot wet mop	Daily	Weekly
Thorough mopping	Daily	Weekly
Empty waste containers	Daily	Daily
Rearrange furniture	Daily	Daily
Wash chalkboards and trays	Daily	Daily
Damp wipe erasers	Daily	Daily
Dust open flat surfaces (as needed)	Weekly	Monthly
Empty pencil sharpeners	Weekly	Weekly
Dust furniture, windows, doors, ledges	Monthly	Monthly
Spot wipe/wash desks, table tops	Weekly	3 Times/Year
Spot clean walls	Weekly	3 Times/Year
Wash door glass	Daily	Daily
Buff/recoat floors	Monthly	3 Times/Year
Dust vents	Monthly	3 Times/Year
Wash trash containers	3 Times/Year	3 Times/Year
Strip/refinish floors	Yearly	Every 24 Months
Shampoo carpets	Yearly	Yearly
Wash desks	Every 4 Months	Not Done
Dust blinds	Twice/Year	Yearly
Wash light fixtures	Every 36 Months	Not Done
Wash windows	Every 36 Months	Every 36 Months

Source: Physical Plant Operations.

Note: These are the written service levels for University computer rooms, classrooms, auditoriums, teaching labs, and conference rooms. The extent to which the new and old service level policies have actually been met is unclear.

we found that Physical Plant had an informal, decentralized system of planning and scheduling work. Staff did not develop time estimates for most jobs, so it was extremely difficult to determine the work backlog of the shops.

- **To date, there have been only minor improvements in work scheduling, although some important foundations have been laid for future improvements.**

Physical Plant managers told us that the types of work planning and scheduling done in the shops in early 1991 was virtually the same as that done in 1988. By managers' accounts, the planning is still inadequate and poorly coordinated between shops.

To improve management's ability to estimate the times of jobs, staff developed a list in 1989 of routine maintenance jobs and the approximate time it takes to complete each. Managers and support staff in each part of campus told us they use this list whenever possible. Still, based on our review of shop tickets closed in March 1991, we found much room for improvement in the number of jobs being estimated. Table 7 compares our 1988 and 1991 findings. The

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**Table 7: Percentage of Shop Tickets With Estimates, 1988 and 1991**

	<u>1988</u>	<u>1991</u>
Percent of all tickets that had estimates:		
Minneapolis campus	10%	32%
St. Paul campus	56	70
Percent of tickets costing more than \$500 that had estimates:		
Minneapolis campus	25%	51%
St. Paul campus	71	89
Percent by which actual hours exceeded estimated hours on tickets costing more than \$500:*		
Minneapolis campus	--	36%
St. Paul campus	--	14

Source: Shop tickets closed in May 1988 and March 1991.

\*This analysis was not done for our August 1988 report on Physical Plant.

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number of estimates being done for Minneapolis shops is still significantly less than the number done for St. Paul shops. For jobs costing more than \$500, the actual cost averaged about one-third higher than the estimated cost, so underestimates are more common than overestimates.<sup>30</sup>

To date, estimates have been used primarily for assessing the staffing levels of individual shops, not to provide feedback to employees on individual jobs. Most of the estimates are done by central office staff or managers, so many employees still question the purpose of the estimates. Under the reorganization, estimates will be established within each zone rather than centrally, so there may be more opportunity for supervisors to use estimates as a tool for holding employees accountable.

The most promising improvement in planning and scheduling has been the development of standard forms for shop backlog reports and daily workplans. Physical Plant management assigned this task to a team of employees. The backlog reports and workplans will be implemented during 1991 as each of the zones are established, although they will not be computerized until later this year.

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<sup>30</sup> For jobs costing more than \$500, 58 percent of jobs had actual costs higher than estimated costs. Of these underestimated jobs, about one-half had actual costs that exceeded estimated costs by more than 50 percent.

The employee team that developed forms for backlog reports and workplans also revised Physical Plant's "shop ticket" forms, which are the work orders given to employees. The revision of this ticket should improve shop work planning and accountability. For example, unlike the existing shop tickets, the new tickets will require Physical Plant staff to identify the priority of the work, scheduled completion dates, and job elements that must be coordinated with other shops.<sup>31</sup> The tickets also appear to enhance accountability by requiring better documentation of work actually done, materials used, and dates completed.<sup>32</sup> The new shop tickets will be implemented during 1991.

We found one other useful development in work planning and scheduling. Historically, the shops have used the same workers to do maintenance and construction work. This resulted in the inefficient practice of workers being called away from long-term remodeling jobs to do maintenance jobs. Today, the shops commit a set number of hours each week to remodeling work, which enables this work to be more effectively scheduled. Under the proposed organization, remodeling workers will be part of a unit separate from maintenance workers, and this should further enhance scheduling.

## Maintenance Management System

It has been an objective of Physical Plant management for at least the past five years to implement a management information system that enables better work planning and scheduling. On several occasions during this time, management has developed requests for proposals or negotiated with vendors. In early 1990, the interim Physical Plant director issued a request for proposal for a maintenance management system. However, several months later, the new Assistant Vice President for Physical Plant chose to shelve the proposal. She wanted her staff to address problems with Physical Plant's manual planning and scheduling processes before proceeding with a computerized system, and she wanted a more comprehensive implementation plan for the system.

In April 1991, Physical Plant again requested maintenance management system proposals from qualified consultants. Physical Plant has encumbered \$1.2 million for the project. The goal of this project is to implement "systemic maintenance" at Physical Plant, not just computerize existing work planning systems. Unlike the previous request for proposals, the current request asks consultants to (1) compare how Physical Plant now manages maintenance to how it should do so, (2) determine how available software can be integrated with University information systems, (3) ensure necessary staff training. Management told us that the consultant would commence work in June 1991, and management estimates that productivity increases resulting from im-

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<sup>31</sup> In 1989, Physical Plant management required shops to indicate priority categories on tickets, but dropped this requirement when staff noticed that shops were calling most jobs "high" priority. For the newly-developed shop tickets, priorities will be determined by the supervisors and customer service staff in each zone, not by the individual shops.

<sup>32</sup> It has been difficult for management to closely compare estimated to actual costs because employees have often added tasks to those on the original shop ticket. For example, an employee may have a shop ticket to replace one relay, but he finds that three need to be replaced. The new ticket should enable supervisors to review such changes in job scope more closely.

proved work planning and scheduling will pay for the cost of the maintenance management system in two years.

In sum, there has been no real progress since 1988 toward the implementation of an improved maintenance information system. We are encouraged that management appears committed to implementing a system in the near future, but will withhold judgment until the system is in place.

## 1990 Trades Agreement

The University of Minnesota has a unique arrangement by which it hires most of its shop labor. Through a master agreement between the University and Minnesota State Building and Construction Trades Council, Physical Plant hires trades workers from 19 different locals. The trades workers are "day laborers" and can be sent back to the union halls at any time. In practice, most of Physical Plant's trades workers work full-time all year at the University. Under the contract, the University pays its maintenance workers the wages that the local unions have negotiated with construction contractors. Our 1988 report urged the University to review this unusual arrangement and seek ways to improve cost-effectiveness.

The master agreement expired in January 1990, giving the University an opportunity to renegotiate its work arrangements with the trades. The new contract:

- Reduces overtime and premium pay.
- Provides prevailing construction wages to maintenance workers.
- Improves consistency among the work practices of individual trades and increases management's flexibility.

Under the old contract, most trades workers received double-time pay for overtime work. The new contract standardized the conditions for overtime pay for all trades, and made most overtime pay time and one-half.<sup>33</sup> The new contract also eliminated "premium pay" for certain types of maintenance work. For example, electricians used to get supplemental pay when they worked on high voltage equipment, and employees received supplements for being union stewards.<sup>34</sup>

Previously, the various trades had different contract provisions governing normal work hours, overtime definitions, holidays, and payment for work shifts outside of normal work hours. The new contract standardizes these work practices among the trades.

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<sup>33</sup> Under the old contract, the University paid about \$500,000 a year in overtime.

<sup>34</sup> Due to inadequacies in payroll information systems, Physical Plant staff were unable to estimate for us the cost savings resulting from the elimination of premium pay, but they believe the cost savings are small compared to those resulting from reduced overtime payments.

The new contract also contains language that clarifies management rights. For example:

The Employer shall direct its working forces as its sole prerogative, including but not limited to hiring, promotion, transfer, discipline, and discharge. No rules, customs, or practices shall be permitted or observed which limit or restrict productivity of the combined or individual working efforts of the employer....

Management has used this prerogative in making recent layoffs. Physical Plant management used to lay off employees based solely on seniority. During the past year, however, management changed this practice and used its discretion when selecting employees to lay off.

Physical Plant continues to pay its maintenance workers prevailing construction wages, a practice that our 1988 report said was unusual for maintenance organizations in Minnesota and elsewhere. As noted earlier, Physical Plant's wages are significantly higher than wages paid to maintenance workers at similar universities. Management proposed a wage cut and then a wage freeze in 1990, neither of which became part of the negotiated contract. Management told us Physical Plant has high costs compared to other organizations mostly because of factors other than wages, such as inadequate management systems. In our view, as discussed earlier, wages are an important factor in Physical Plant's higher costs. We think the University should seriously review wages in its 1993 contract negotiations with the trades. In private industry, construction workers have typically been paid higher wages than maintenance workers to compensate for their sporadic work. The recent Physical Plant reorganization, with its separation of maintenance and construction workers, might make wages a more compelling negotiating issue at Physical Plant.

In April 1990, Physical Plant management developed a "strike plan," outlining responsibility for maintenance emergencies in the event of a strike. Prior to that time, the University did not have a detailed strike plan, so this initiative demonstrated management's willingness to take a strike, if necessary. In June 1990, trades workers approved the new contract by a slim 13-vote majority.<sup>35</sup>

## Work Assignment and Jurisdiction

Our 1988 report noted that Physical Plant employs relatively more specialized trade workers (such as carpenters, electricians, and plumbers) than other maintenance organizations. This increases maintenance costs because (1) specialists have higher wage rates than do general mechanics, and (2) a specialized work force sometimes requires workers from several trades to assist on a single job. For example, a Physical Plant carpenter might remove a ceiling panel so that an electrician can repair equipment behind it.<sup>36</sup> The "jurisdictions" of various types of workers are determined by collective bargaining

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<sup>35</sup> The workers had rejected one previous management proposal.

<sup>36</sup> Presently, there may be separate shop tickets from several trades for a single job, and this makes it difficult for management to determine what was the full cost of doing the job.

agreements, state licensing laws, code requirements, past organizational practices, and management prerogative. Because the way in which work is assigned affects the number and type of staff required by Physical Plant, there is keen interest among the Teamsters and various trades in jurisdictional issues.

The 1990 labor agreement between the University and the trades council called for the state Bureau of Mediation Services (BMS) to address Physical Plant's work jurisdiction issues. According to the agreement, "If the issue cannot be resolved by negotiations, both parties agree to abide by a decision by the Bureau, or a neutral person selected by the Bureau." In Fall 1990, representatives of the trades, Teamsters, University, and BMS first met to discuss jurisdiction issues. BMS began convening more formal presentations and negotiations in April 1991. The University would like the flexibility to make more work assignments based on cost-effectiveness, rather than past practices.

Physical Plant managers told us they want to take a "common sense" approach to assignments as they implement the zone system on the Twin Cities campus. For example, in the case of the electrical repair cited above, management will assign the job to an electrician, which it believes is consistent with private industry practices.

Overall, there have been no significant changes in the way work is assigned at Physical Plant since our 1988 report. The commitment of the affected parties to enter negotiations and, if necessary, be bound by the decision of a mediator suggests that these issues will be addressed and resolved in some fashion. However, it is not yet clear how long this process will take, and how Physical Plant management will make use of its flexibility to assign work.

## Preventive Maintenance on Equipment

In 1988, we found that Physical Plant had a preventive maintenance system that had evolved over 20 years with little central Physical Plant control or engineering input. There was little consistency between shops in the type of work done. More important, management could not evaluate the cost-effectiveness of preventive maintenance because there was no data on historical maintenance spending for various pieces of equipment. Preventive maintenance shop tickets provided minimal direction to employees about the activities to be performed.

In our follow-up research, we found that:

- **Management has expressed a commitment to improving the preventive maintenance system, but only modest improvements have been made so far.**

To date, staff have determined appropriate preventive maintenance frequencies and time standards for activities on the West Bank of the Minneapolis campus. Also, staff have developed detailed specifications for electrical preventive maintenance so that workers will have clearer work assignments.

In early 1990, Physical Plant staff anticipated that the first application of the proposed maintenance management system would be to improve the preventive maintenance tracking system. Management's 1990 decision to delay implementation of a maintenance management system resulted in a slower, more manual process for making improvements in the preventive maintenance system.

Overall, we think that management is asking the right questions about preventive maintenance and seems committed to making changes in conjunction with the reorganization. However, progress to date has been slower than staff anticipated in our discussions with them last year.

## Transportation of Workers and Materials

In 1988, we found that many shop workers had to wait too long to get transportation to work sites, with particular problems at the beginning and end of the work day. Most workers reported for work each morning at a central location, and many relied on a network of 23 Teamster drivers to take them to their work sites. Virtually all driving was done by Teamsters because shop workers were not allowed to drive themselves or their materials to job sites. We recommended that employees be given the authority and vehicles necessary to drive themselves to more jobs. We also suggested that management stagger the work times of the shops and encourage workers to walk to job sites, when feasible.

In our 1991 follow-up research, we interviewed foremen and workers in most of Physical Plant's shops. We did not formally survey Physical Plant workers about the amount of time they spend waiting for rides, as we did in our 1988 study. In our interviews:

- **Employees told us that they spend less time waiting for rides today than they did three years ago.**

Today, there are seven fewer Teamster drivers than there were in 1988. On a typical day, there are only two 12-passenger vans being used to transport workers, compared to five in 1988. But Physical Plant estimates that at least one dozen additional vehicles have been made available to the shops so that employees can drive themselves to jobs. The shops have also staggered their work hours and encouraged employees to walk to assigned jobs.<sup>37</sup> Employees still have problems finding places to park vehicles near their work sites, which sometimes results in loss of productive time.

Management's proposal for a system of work zones should further reduce transportation costs. Under this plan, workers will report at the beginning of each day to the job site, not to a centralized location. Most employees will do maintenance work only within their geographic zone, so they should be able

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<sup>37</sup> Employees told us that waiting times actually increased in late 1988 and early 1989 after management laid off many of the drivers, as well as the central dispatcher. For awhile, foremen were dispatching vehicles, a practice we criticized in our 1990 status report. Physical Plant rehired the dispatcher and several drivers in 1989, and foremen no longer dispatch vehicles.

to walk to most jobs. Centralized drivers will be used primarily for delivery of materials, not people.

## SUPERVISION

Our 1988 report raised several concerns about supervision of Physical Plant employees. Nearly one-third of custodial and shop employees we surveyed expressed dissatisfaction with the overall competence of their supervisors. About 40 percent of workers said that supervisors "sometimes, rarely, or never" make job expectations clear to them, and 40 percent said supervisors "sometimes, rarely, or never" respond to employee concerns. Most Physical Plant employees--particularly in the shops--had never had a written performance appraisal.

In the shops, there was a long history of workers being supervised by union foremen, rather than civil service managers. Management believed that foremen could not effectively manage and discipline fellow union members, so they hired "area managers" in 1988 to supervise the shops. However, the respective supervisory responsibilities of the area managers and foremen were unclear. Physical Plant terminated the area managers in 1989, returning to supervision of the shops by union foremen. In 1991, management has begun hiring civil service managers in geographic zones to supervise custodians and shop workers. Each zone will have a "facility supervisor" responsible for overall financial and facilities management, and several "operations supervisors" who directly supervise employees. Physical Plant will still employ foremen in cases where they are required by the University's trades contract, but the total number of foremen will decrease under the new organization.<sup>38</sup>

## Recruitment and Training

The adequacy of Physical Plant supervision will depend largely on the quality of zone supervisors recruited during the coming year, and on management's ability to expand supervisory training options. With the pending reorganization, many Physical Plant shop and custodial employees will have different supervisors one year from now than they have today. Management has taken steps to ensure a more broadly-based hiring process for the new supervisory positions by establishing applicant interview teams of Physical Plant employees and people from other University departments.<sup>39</sup> Still, one of the key challenges facing Physical Plant will be to recruit supervisors who have both proper management skills and credibility with the people they supervise.

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<sup>38</sup> The contracts for individual trades specify circumstances in which foremen are required. For example, if a zone has four electricians, the contract requires that one be designated a "foreman." If a zone has 11 electricians, there must also be a "general foreman," and if it has 21 electricians, a second foreman must be designated. Because the zone system will disperse some large shops throughout campus, there will be fewer circumstances in which foremen and general foremen are required.

<sup>39</sup> Physical Plant started using this approach in December 1990.

Until the hiring occurs, it is unclear how many of Physical Plant's current staff will be hired into the 43 restructured supervisory positions. Some employees have expressed concerns that several of Physical Plant's new managers and supervisors have been hired from outside the University.<sup>40</sup> Physical Plant managers have hired people from outside the University because they want to bring the perspectives of private industry to Physical Plant, and they recognize that many of Physical Plant's current supervisors lack experience outside of the University setting. However, management has also demonstrated a willingness to consider existing Physical Plant employees for the 43 restructured positions by deciding in April 1991 to initially make the positions available for internal University promotion only.

Regardless of whether "insiders" or "outsiders" are hired for the supervisory jobs, management must demonstrate a stronger commitment to internal supervisory training than has been evident in the past. We found that:

- **Training opportunities for supervisors are still inadequate.**

Until 1990, management offered supervisors little in-house training. Management hired a personnel consultant in early 1990 to, among other duties, develop training courses. Several courses were developed, but only one--a two-day course on supervisory management and communications--was conducted in 1990.<sup>41</sup> Much of the personnel consultant's time was spent working on top management team-building and planning, doing one-on-one training, hearing employee grievances, and working with an employee committee on planning and scheduling. In 1991, management decided to recruit a second training specialist, but then postponed this pending review of budget requirements.

## Employee Performance Appraisals

- **Physical Plant has made little progress toward a comprehensive employee appraisal system.**

According to our 1988 employee survey, 54 percent of shop workers and 40 percent of custodians said that their supervisors "sometimes, rarely, or never" informed them about the quality of their work. Most of the shop workers had never had a formal performance appraisal. As recently as early 1990, the former head of the Minneapolis shops believed that performance appraisals were unnecessary.

Today, the vast majority of shop staff still have never had a performance appraisal. The only real progress toward a performance appraisal system has been the testing of twice-a-year appraisals in the seven-person sign shop. Management believes that expectations for employees must be clarified before doing appraisals, and they hope to update the job descriptions and

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<sup>40</sup> For example, the director of Operations and Construction and the facility supervisors for the West Bank and Health Sciences zones--all hired in the past year--are new to the University of Minnesota.

<sup>41</sup> Of Physical Plant's 130 supervisors, 106 took the course.

review the job classifications of virtually all Physical Plant employees. They also believe that improved work planning systems will make expectations for employees more clear.

Custodians do not receive formal performance appraisals, but supervisors are supposed to inspect the areas cleaned by their staff once every three months and complete an inspection summary. In our interviews for this follow-up, staff told us that this goal is not always achieved. Staff also noted that these quarterly inspection visits are some custodial supervisors' only contacts with their staff at work sites, a level of supervision that we think is inadequate.

Finally, University policy for professional/administrative positions and rules for civil service positions require performance evaluations, but managers told us that most of these Physical Plant staff do not receive them.

## Clarification of Shop Supervisors' Roles

In our 1988 study, we found that management had never clarified its expectations of shop foremen, nor had it distinguished the duties of foremen and their managers. Some of the confusion about responsibilities was eliminated in 1989 when the interim director of Physical Plant laid off the area managers that foremen reported to. Current Physical Plant management deserves credit for taking further steps toward clarifying shop supervisors' roles and responsibilities. In January 1991, management developed a statement of supervisory responsibilities that applies to existing foremen and civil service supervisors. In April 1991, management developed position descriptions for the new zone supervisor positions.

It is possible that responsibilities will become blurred again in 1991 when the reorganization takes effect. In particular, there will be a need for management to distinguish the responsibilities of Physical Plant's new civil service supervisors and the remaining foremen.

## Employee Handbook

It has taken Physical Plant longer than anticipated to develop a comprehensive handbook for all employees. Such a handbook would provide supervisors throughout Physical Plant with a consistent set of policies and procedures.<sup>42</sup> Management was working on the handbook at the time of our February 1990 Physical Plant status report, and it has not yet completed the task. During our interviews for this follow-up report, management told us that the handbook would be ready in some form for the initial implementation of the zone system in June 1991.

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<sup>42</sup> Presently, custodial supervisors have a handbook, but management thinks that some of its requirements are inappropriate.

## MISCELLANEOUS ISSUES

### Custodial Work Assignments

Our 1988 report found some problems with the equity of custodial work assignments. By applying accepted industry time standards to the cleaning tasks given to custodians in different parts of campus, we found considerable variation in the work assignments given to custodians. Many custodians had assignments that could not realistically be done in an eight-hour day. We recommended that management review workload imbalances more closely.

Presently, management is using standards similar to those we used in 1988 to simulate the staffing impacts of changes in custodial service levels. For example, management can now estimate how many staff would be needed to vacuum classroom floors twice, rather than once, a week. This should be a useful management tool. We continue to think that management should also use this tool to periodically examine the workloads of individual employees.

### Remodeling

In 1988, Physical Plant was doing virtually no remodeling work. Physical Plant management wanted to be able to oversee their own remodeling projects, a role historically played by the Office of Physical Planning. When University administrators refused to grant this authority, Physical Plant management decided to get out of the remodeling business and reduced staffing accordingly. Since that time, Physical Plant has accepted Physical Planning's oversight role and started doing remodeling again, in keeping with our 1988 recommendations.

### Heating Plant

In our 1988 study, we reported that several of Physical Plant's boilers were at the end of their useful lives, and managers were concerned about the possibility of a breakdown in the heating and cooling system. We noted that the Regents had not been informed about the problems until 1987. University administrators had not built up reserves for eventual replacement of the boilers, nor had they explored alternatives to the existing heating system.

Physical Plant hired a consultant in 1989 to determine the most cost-effective way to address the University's heating and cooling needs. The consultant's report recommended that the University construct a new heating plant. The Board of Regents appointed a committee to explore the option of purchasing heating from an outside vendor. That committee solicited bids, evaluated four competing proposals, and recommended one. The Board of Regents, however, authorized the University to continue to negotiate with three proposed vendors. University administrators will make recommendations to the Regents in November 1991.

## CONCLUSIONS AND RECOMMENDATIONS

Our 1990 status report on Physical Plant noted that "the progress required by Physical Plant is more noteworthy than the progress that has been made." Despite some important changes in the past year, we continue to believe this is the case.

Since April 1990, Physical Plant has developed a new, more cohesive management team. This team should receive credit for (1) obtaining some concessions from labor in last year's negotiation of a new trades contract, (2) developing an ambitious reorganization plan, and (3) improving Physical Plant's external relations. At the same time, while there has been progress toward addressing Physical Plant's long-standing management and efficiency problems, the progress has been slow and has not yet produced very tangible results. The implementation of the West Bank zone was scheduled for April 1991, then rescheduled for June. Physical Plant's managers told us they underestimated the time required to make changes, and they believe it will take several years to make Physical Plant an efficient operation. They told us that it has been extremely difficult to change an organization where the long-time employees have not been exposed to alternative ways of doing things. Although Physical Plant's management team is now in place, it is still trying to find people within the organization who can help implement new plans and approaches. It remains to be seen whether management's proposed changes will result in a more cost-effective organization that improves service to customers.

In addition, it remains to be seen whether employees will support the proposed changes. Compared to previous managers, current managers have been more visible to employees and willing to listen to employee concerns. However, management's credibility among employees has been hurt by its decision to announce the reorganization proposal to employees before it could answer questions about many of the details. In the coming year, management's credibility with employees will be tested by its ability to (1) make good selections for more than 40 supervisory positions, and (2) implement organizational changes that improve customer service. In addition, management's credibility may be tested by future decisions on work assignment, staff size, and contracting for services now done in-house. Although management has told employees that layoffs will be a last resort when making budget reductions, management intends to analyze the appropriate size of Physical Plant's work force, and consider which workers within or outside of Physical Plant can best accomplish the tasks to be done.

We think that Physical Plant now has a management team with considerable talent and vision, and it should be given the opportunity to implement its proposals. Although the improvements to date are not very tangible, management has laid a foundation for change. But University administrators and Physical Plant management should also be held accountable for implementing the proposals. University Regents have expressed, both publicly and in our discussions with them, an interest in progress reports from management and

the development of performance "indicators." Unfortunately, we found that Physical Plant management has not developed such indicators, nor has it determined what level of improvement on these indicators might be reasonable. Physical Plant managers told us they want their organization to meet "industry standards," and we think it is reasonable to expect them to articulate these standards. We recommend that:

- **Management should develop measurable objectives as soon as possible.**

Management told us that the inadequacy of Physical Plant's information systems makes it virtually impossible to establish baseline data from which to derive objectives for improvement. Nevertheless, at a minimum, we think management should develop the following:

- **Timetables for implementing various improvements at Physical Plant, including the steps necessary to get adequate baseline data for measuring future improvements, and**
- **A list of measurable indicators of efficiency and effectiveness that can be tracked when Physical Plant information systems are improved.**

Once management develops timetables and performance indicators, it can consider the amount of improvement that is reasonable for various indicators. Management should make particular efforts to develop objectives for cost containment and employee productivity, which have been central to legislative concerns about Physical Plant.

We further recommend that:

- **Physical Plant management should resume periodic progress reports to both the Board of Regents and Legislature. We suggest that these reports occur twice a year through 1993.**

The Program Evaluation Division will continue to monitor the effectiveness of the changes being made at Physical Plant.

Our other general recommendation is in the area of training. An organization of 1,300 employees--especially one that is undergoing major organizational changes--needs to invest in its employees. Historically, there has been too little training available to Physical Plant staff. In 1990, management showed a greater commitment to training by hiring an in-house personnel consultant and a safety officer, and it intends to hire a full-time trainer in 1991. Still, the amount of training offered to date is minimal. For example, to make the new organization work, customer service staff need training in work assignment

and priority setting, administrative staff need training in financial analysis, and supervisors need training in performance review, work scheduling, communications, and computer use.<sup>43</sup> We recommend that:

- **Physical Plant should develop a training plan and determine resources within the University and Physical Plant capable of meeting training needs.**

Finally, we wish to re-emphasize suggestions made elsewhere in this report. We recommend that:

- **The University should ensure that the roles of Physical Plant and the Office of Physical Planning are clarified.**
- **Physical Plant should take additional steps to clarify the roles of civil service supervisors and trades foremen.**
- **For the purpose of negotiating a contract with trades workers in 1993, the University should reconsider its practice of paying prevailing construction wages to maintenance workers. The University should continue its efforts to identify tasks now done by specialized trades workers that could be done by general mechanics, and assign work accordingly. In addition, as the University negotiates a contract with the Teamsters in 1991, it should consider the salary differences that we noted between custodians at the University and other organizations.**

Regarding the last recommendation, we recognize that factors besides salaries may contribute to Physical Plant's high costs, and it might be possible for management to improve the cost-effectiveness of Physical Plant without addressing wages. Nevertheless, we think that salaries are an important factor in Physical Plant's high costs, and the University should carefully consider this as it negotiates future contracts.

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<sup>43</sup> Physical Plant should consider developing a presupervisory training program, such as the one used by Indiana University. The goal of this program is to develop a pool of potential first-line supervisors from existing staff by providing a special curriculum of skill training. See James R. Davis and Paul Schneller, "Presupervisory Training: Less Talk, More Action," in *Critical Issues in Facilities Management: Management Basics* (Alexandria, VA: APPA, 1990), 84-93.

# USER EVALUATION OF PHYSICAL PLANT SERVICES

## Appendix

The purpose of this survey is to obtain the views of key University of Minnesota staff about services provided by Physical Plant Operations. The survey is being sent to University deans, directors, and department heads (and their assistants). As best you can, please complete the survey to reflect the experience and opinions of the University unit you head. Your responses should reflect your unit's experience with Physical Plant during the past 12 months.

Parts A and B of the survey ask you to evaluate Physical Plant's **maintenance** and **custodial** work. **Maintenance** includes activities performed by Physical Plant's shops, such as plumbing, carpentry, painting, electrical, and miscellaneous repair work. Physical Plant charges departments for nonroutine maintenance work and pays for routine work from its own budget. In contrast to maintenance work, the primary aim of **custodial** work is keeping building interiors clean.

1. Within my department or University unit, primary responsibility for dealing with most Physical Plant issues rests with (*check one*):

- 132  a. Me  
 31  b. Someone I report to  
 99  c. Someone who reports to me  
 41  d. Other (specify) \_\_\_\_\_

2. I consider myself (*check one*):

- 91  a. Very familiar with Physical Plant's services to my unit.  
 111  b. Mostly familiar with Physical Plant's services to my unit.  
 83  c. Somewhat familiar with Physical Plant's services to my unit.  
 18  d. Unfamiliar with Physical Plant's services to my unit.

### Part A: Maintenance

(Please circle the appropriate response)

	Rarely/ Never	Sometimes	Often	Usually/ Always	Don't Know/ Missing
3. Physical Plant staff perform high quality maintenance work.	8	69	80	129	17
4. When we call Physical Plant with a problem or request, staff respond in a reasonable amount of time.	8	76	93	108	18
5. Physical Plant staff are available to answer our questions about maintenance work.	15	71	85	96	36

(Please circle the appropriate response)

	Rarely/ Never	Sometimes	Often	Usually/ Always	Don't Know/ Missing
6. For projects that will be charged against our budget, Physical Plant staff provide us with cost estimates when we request them.	10	35	46	159	53
7. The actual cost of work done by Physical Plant is reasonably close to the estimates we receive.	14	69	75	77	68
8. The costs billed to us for Physical Plant's maintenance services are reasonable.	88	114	31	17	53
9. Physical Plant maintenance staff have a "customer orientation" and try to keep us satisfied.	35	94	82	60	32
10. Physical Plant maintenance staff are productive and efficient.	29	118	73	48	35
11. Physical Plant maintenance staff do their work with a minimum of disruption to our work.	7	59	93	128	16

12. Our overall level of satisfaction with Physical Plant's maintenance services is: (*check one*)

- 15  a. Very dissatisfied  
 60  b. Dissatisfied  
 82  c. Neutral  
 104  d. Satisfied  
 29  e. Very satisfied  
 13  f. Don't know/Missing

13. In the past year, our satisfaction with Physical Plant's maintenance services: (*check one*)

- 41  a. Increased  
 214  b. Stayed the same  
 17  c. Decreased  
 31  d. Don't know/Missing

**Part B: Custodial**

*(Please circle the appropriate response)*

	Rarely Never	Sometimes	Often	Usually/ Always	Don't Know/ Missing
14. Our space is cleaned as frequently and thoroughly as we think necessary and reasonable.	94	96	40	54	19
15. When we make special requests of Physical Plant custodians, they are able to accommodate our needs.	18	77	67	112	29
16. Physical Plant staff are available to answer our questions about custodial work.	32	83	55	75	58
17. Physical Plant custodial staff have a "customer orientation" and try to keep us satisfied.	48	75	59	80	41
18. Physical Plant custodial staff are productive and efficient.	55	91	58	54	45
19. Physical Plant custodial staff do their work with a minimum of disruption to our work.	9	29	69	174	22

20. Which of the following best describe your level of satisfaction with Physical Plant's custodial services:  
*(Circle "don't know" if not applicable to your unit)*

*(Please circle appropriate response)*

	Very Dis- satisfied	Dis- satisfied	Neutral	Satisfied	Very Satisfied	Don't Know/ Missing
a. Office space:	25	84	65	76	35	18
b. Classroom space:	22	32	40	49	13	147
c. Lab/research space:	13	25	30	30	10	195
d. Restrooms:	51	64	55	77	31	25
e. Overall:	26	86	66	77	25	23

21. In the past year, our overall satisfaction with Physical Plant's custodial services: (*check one*)

- 29  a. Increased  
187  b. Stayed the same  
55  c. Decreased  
32  d. Don't know/Missing

### Part C: Comments

(*Note: In addition to commenting on maintenance and custodial work, feel free to comment on other Physical Plant services, such as building temperature control, building security, grounds maintenance, and waste disposal.*)

22. Please list any positive comments you have about Physical Plant, such as the things staff do well, or areas in which Physical Plant seems to be improving:

23. Please list any areas in which Physical Plant needs to show improvement (give specific examples of problems you have had):

24. Please make any suggestions that you think would improve Physical Plant's services to your academic unit or the University as a whole.

**Thank you for your cooperation.** All responses will be considered confidential. If you have questions, please contact Joel Alter (296-8313). Please place the completed survey in the enclosed envelope and send it *by May 1, 1991* to:

OFFICE OF THE LEGISLATIVE AUDITOR  
PROGRAM EVALUATION DIVISION  
Veterans Service Building  
St. Paul, Minnesota 55155

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**REPORT OF THE  
FINANCIAL AUDIT  
DIVISION**



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UNIVERSITY OF MINNESOTA:  
PHYSICAL PLANT OPERATIONS

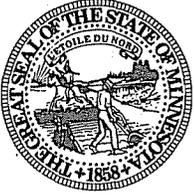
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July 1991

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Financial Audit Division  
Office of the Legislative Auditor  
State of Minnesota





STATE OF MINNESOTA

**OFFICE OF THE LEGISLATIVE AUDITOR**

VETERANS SERVICE BUILDING, ST. PAUL, MN 55155 • 612/296-4708

JAMES R. NOBLES, LEGISLATIVE AUDITOR

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Representative Ann Rest, Chair  
Legislative Audit Commission

Members of the Legislative Audit Commission

Dr. Nils Hasselmo, President  
University of Minnesota

Elton A. Kuderer, Chair  
University of Minnesota Board of Regents

Audit Scope

We have conducted a financial related audit of the University of Minnesota Physical Plant Operations for the year ended June 30, 1990. Section I provides a brief description of Physical Plant's activities and finances. Sections II through VIII discuss current audit concerns.

We conducted our audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial activities attributable to the transactions of the University of Minnesota Physical Plant Operations are free of material misstatements.

We performed tests of the University of Minnesota Physical Plant Operation's transactions to obtain reasonable assurance that the department had, in all material respects, administered its programs in compliance with certain provisions of laws and regulations. However, our objective was not to provide an opinion on overall compliance with such provisions.

Management Responsibilities

The management of the University of Minnesota Physical Plant Operations is responsible for establishing and maintaining an internal control structure. This responsibility includes compliance with applicable laws and regulations. In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of internal control structure policies and procedures. The objectives of an internal control structure are to provide management with reasonable, but not absolute, assurance that:

- assets are safeguarded against loss from unauthorized use or disposition;
- transactions are executed in accordance with applicable legal and regulatory provisions, as well as management's authorization; and

- transactions are recorded properly on the University of Minnesota accounting system in accordance with applicable policies and procedures.

Because of inherent limitations in any internal control structure, errors or irregularities may nevertheless occur and not be detected. Also, projection of any evaluation of the structure to future periods is subject to the risk that procedures may become inadequate because of changes in conditions or that the effectiveness of the design and operation of policies and procedures may deteriorate.

#### Internal Control Structure

For purposes of this report, we have classified the significant internal control structure policies and procedures in the following categories:

- budgeting,
- charges for services,
- payroll/personnel,
- utilities,
- repair and replacement,
- purchasing, and
- inventory.

For all of the internal control structure categories listed above, we obtained an understanding of the design of relevant policies and procedures and whether they have been placed in operation. To achieve this objective, we reviewed selected financial policies and practices in effect during the audit period and as of the time of our fieldwork in March 1991. Our review was more limited than would be necessary to express an opinion on the University of Minnesota Physical Plant Operation's system of internal accounting control taken as a whole.

#### Conclusions

The majority of Physical Plant Operation's financial transactions are recorded in its budgetary accounts on the University of Minnesota's accounting system. However, a significant portion of Physical Plant Operation's financial transactions are charged directly against other departments' accounts. The accounting system does not readily provide information on the amount of such direct charges to other departments. We reviewed selected accounting records and tested transactions in an attempt to determine the amount of Physical Plant Operations's financial activity which is charged directly to other departments. This information is presented in various Tables in Sections I and III of this report. However, because the accounting records were incomplete, we were unable to apply other auditing procedures to satisfy ourselves as to the completeness and accuracy of this information.

Our review disclosed the conditions discussed in findings 1 to 15 involving the internal control structure of the University of Minnesota Physical Plant Operations. We consider these conditions to be reportable conditions under standards established by the American Institute of Certified Public Accountants. Reportable conditions involve matters coming to our attention relating to significant deficiencies in the design or operation of the internal control structure that, in our judgment, could adversely affect the entity's ability to record, process, summarize, and report financial data.

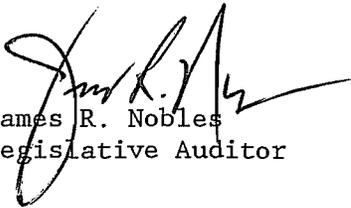
A material weakness is a reportable condition in which the design or operation of the specific internal control structure elements does not reduce to a relatively low level the risk that errors or irregularities in amounts that would be material in relation to the financial activities being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. We believe the following reportable conditions are material weaknesses:

- The University's financial information on Physical Plant services is incomplete, as discussed in Finding 1. For fiscal year 1990, we identified additional expenditures of \$23 million for services which Physical Plant charged directly to other university department budgets. These additional expenditures account for over 30 percent of Physical Plant's service costs.
- Physical Plant continues to lack a clear definition of the basis for its operating budget. Management has not clearly articulated what levels and types of services it intends to provide from the operating budget. The lack of precision in the Physical Plant budget has resulted in the accumulation of over \$19 million in residual balances. Findings 2-5 discuss our concerns with the Physical Plant operating budget.
- The heating plant has accumulated utility reserves arbitrarily. It also has used the reserves in a manner which is not equitable to all customers. Findings 6-7 discuss our concerns with the utilities.
- Physical Plant has not formulated a meaningful plan on how to address a deferred maintenance problem of about \$300 million, as discussed in Finding 8.

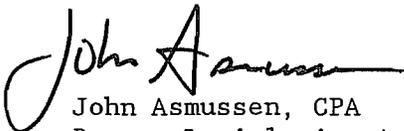
The results of our tests indicate that, except for the issues discussed in findings 15 and 16, with respect to the items tested, the University of Minnesota Physical Plant Operations complied, in all material respects, with the provisions referred to in the audit scope paragraphs. With respect to items not tested, nothing came to our attention that caused us to believe that the University of Minnesota had not complied, in all material respects, with those provisions.

Representative Ann Rest, Chair  
Members of the Legislative Audit Commission  
Dr. Nils Hasselmo, President  
Elton A. Kuderer, Chair  
Page 4

This report is intended for the information of the Legislative Audit Commission and management of the University of Minnesota Physical Plant Operations. This restriction is not intended to limit the distribution of this report, which was released as a public document on July 1, 1991.



James R. Nobles  
Legislative Auditor



John Asmussen, CPA  
Deputy Legislative Auditor

END OF FIELDWORK: March 20, 1991

REPORT SIGNED ON: June 18, 1991

UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

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UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

I. INTRODUCTION

In our prior audit of Physical Plant Operations, we concluded that the department lacked adequate financial systems and controls. The organization of Physical Plant has changed considerably since our prior audit. Susan Markham was appointed Assistant Vice President for Physical Plant Operations in March 1990. She has appointed a six member management team. In February 1991, management presented a new organization model to Physical Plant employees. The objective of this model is to provide better management of University facilities.

Section II of this report discusses management's efforts as they relate to Physical Plant's internal control structure. Sections III to VIII discuss our concerns regarding financial controls over various components of Physical Plant's activities.

Table I summarizes Physical Plant financial activity for fiscal year ended June 30, 1990.

Physical Plant incurred costs totalling approximately \$79 million in fiscal year 1990. Physical Plant's budget allocation financed approximately \$56 million and \$23 million was charged to other departments. Table II summarizes expenditures by category.

Table I

Summary of Financial Activity  
Fiscal Year 1990

Source of Funds:	
Balance Forwarded From 1989	\$11,913,323
Fiscal Year 1990 Budget	64,059,601
Charges To Other Departments	23,036,068
Revenue	<u>936,173</u>
Total Sources Of Funds	<u>\$99,945,165</u>
Use Of Funds:	
Expenditures	\$78,907,436
Payments On Loans	1,832,937
Increase In Inventory	<u>208,682</u>
Total Uses Of Funds	<u>\$80,499,055</u>
Funds Forwarded To 1991	<u>\$19,446,110</u>

Source: Office of the Legislative Auditor calculations from University accounting records. We were unable to verify the completeness and accuracy of the charges to other departments and related expenditures.

UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

Table II  
 Summary of Expenditures  
 Fiscal Year 1990

	<u>Physical Plant Budget</u>	<u>Charges To Other Departments</u>	<u>Total Expenditures</u>
Maintenance	\$11,285,691	\$22,443,467	\$33,729,158
Repair & Replacement	4,534,641		4,534,641
Custodial and Grounds	12,078,483	592,601	12,671,084
Utilities	20,012,072		20,012,072
Engineering and Planning	763,083		763,083
Administration	1,300,227		1,300,227
Payroll Fringe Benefits	3,300,000		3,300,000
Other	<u>2,164,037</u>	<u>                    </u>	<u>2,597,171</u>
Total	<u>\$55,438,234</u>	<u>\$23,036,068</u>	<u>\$78,907,436</u>

Source: Office of the Legislative Auditor calculations from University accounting records. We were unable to verify the completeness and accuracy of the charges to other departments.

## II. INTERNAL CONTROL STRUCTURE

The concept of internal control structure often means different things to different people. From a financial auditor's perspective, "An entity's internal control structure consists of the policies and procedures established to provide reasonable assurance that specific entity objectives will be achieved." (Source: SAS 55, Consideration of Internal Control Structure in a Financial Statement Audit, AICPA, 1988.) The AICPA auditing standards further identify three distinct elements of internal control:

- A Control Environment reflects the overall attitude, awareness and actions of the board of directors, management, and others concerning the importance of control and its emphasis in the entity.
- An Accounting System consists of the methods and records established to identify, assemble, analyze, classify, record, and report an entity's transactions and to maintain accountability for related assets and liabilities.
- Control Procedures are those policies and procedures in addition to the control environment and accounting system that management has established to provide reasonable assurance that specific objectives will be achieved.

A control environment is the most fundamental element of internal control structure. It provides the foundation for the other two elements. Successful organizations work hard to establish an appropriate emphasis on control. Management's attitude and ability to clearly communicate its wishes are vital determinates of whether an organization successfully achieves its objectives.

An effective internal control structure will be helpful for pursuing a variety of management objectives. Financial auditors are interested primarily in evaluating management's efforts in accomplishing two objectives: generating complete, reliable financial information and complying with applicable finance related laws and regulations. A related objective also draws the attention of financial auditors: using an entity's resources in an effective and efficient manner.

Physical Plant management has concentrated much of its efforts on establishing an effective control environment. We believe that many of our prior audit findings resulted from a weak control environment. As part of its proposed organizational model, Physical Plant management identified various goals and objectives. Clearly stated goals and objectives are essential to proper financial management and provide a basis for other key decisions. We think that it is appropriate for management to set broad goals before establishing specific policies and procedures.

## UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

The accounting system is an organization's method for obtaining accurate and meaningful information. Without this essential information, management will have difficulty meeting its objectives.

We found that:

1. The University accounting system does not provide complete comprehensive financial information on Physical Plant.

As shown in Table II, funding for approximately 70 percent of Physical Plant service costs is derived from its state appropriation budgetary allocation. The remaining 30 percent comes from direct charges to other University departments for services provided. The University accounting system does not readily provide information on the amount of the direct charges to other departments. We believe that financial information should reflect the full cost of services. Management must have accurate, timely financial information for appropriate decision making.

The University administration has taken steps to improve its accounting information. The University is developing a new general ledger accounting system, as well as a job costing system for Physical Plant. In our prior audit report, we concluded that the University financial information system did not provide an adequate basis for management decision making. With the new system, Physical Plant should be able to better measure the cost of its services. In addition, Physical Plant has hired a chief financial officer with broad financial management responsibilities. This position should provide Physical Plant with more expertise in reviewing and analyzing the financial information.

We believe it is appropriate that Physical Plant management has focused its initial efforts on the fundamental issues relating to control environment and accounting system. Yet, a multitude of control procedure deficiencies remain. These weaknesses increase the risk that Physical Plant will fail to meet its goals and objectives. Management must continue its efforts to implement corrective actions. In the following sections, we identify various internal control weaknesses. Some of the recommendations are addressed to the University administration. If Physical Plant management is to improve financial controls, it must receive the administration's support.

We recommend:

- Physical Plant should continue to work with University administration to ensure that the new accounting system provides comprehensive financial information.

UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

III. FUNDING AND BUDGETING

The University management committee establishes budget principles. The University Budget Office prepares the annual budget, which is approved by the Board of Regents. The basis for the budget is primarily the prior year's allocation. Total funding available in any given year may vary from the budget allocation. University policy allows departments to retain any surplus funds from the previous year. Conversely, departments are responsible for covering deficits from the prior year.

Table III summarizes Physical Plant's funding for fiscal year 1990.

Table III  
Funding Sources  
Fiscal Year 1990

State Appropriations:	
Allotment for Fiscal Year 1990	\$63,559,601
Allotment for New Space	500,000
Prior Year Balances:	
1989 Free Balance Forwarded	2,087,700
1989 Encumbrance Balance Forwarded	9,825,623
External Billings	<u>936,173</u>
Operating Budget	\$76,909,097
Charges to Other Departments	<u>23,036,068</u>
Total Funding	<u>\$99,945,165</u>

Source: Office of the Legislative Auditor calculations from University accounting records. We were unable to verify the completeness and accuracy of the charges to other departments.

We found that:

2. Physical Plant's budget allocation is not based on cost of services.

Physical Plant has not established the standard levels of service which it will finance from the operating budget. The level of service is a primary factor which drives the cost of Physical Plant operations. Thus, we could not judge the adequacy of the operating budget. Furthermore, we noted conflicting indications regarding its sufficiency.

UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

We found:

3. Physical Plant has accumulated significant residual balances.

At the end of fiscal years 1989 and 1990, Physical Plant had substantial residual budgetary balances. Table IV shows the June 30, 1990 balances by category.

TABLE IV  
Summary of Residual Budgetary Balances  
June 30, 1990

	<u>Encumbrance Balance</u>	<u>Specified Operating Reserves</u>	<u>Asset Replacement Reserves</u>	<u>Free Balance</u>
Utilities	\$ 2,242,006	\$2,502,340	\$2,316,693	\$ -0-
Repair and Replacement	7,393,256			(196,630)
Other Repair and Maintenance	1,004,236		18,720	(782,114)
Payroll Accrual and Fringe	-0-			836,462
Custodial and Grounds	23,205		708,994	(100,658)
New Space	-0-			500,000
Administration	96,310			469,026
Other	<u>2,014,119</u>	<u>                    </u>	<u>                    </u>	<u>817,509</u>
Total Budgetary Balances	<u>\$12,773,132</u>	<u>\$2,502,340</u>	<u>\$3,044,407</u>	<u>\$1,543,595</u>

Source: Physical Plant Finance Division calculations from University accounting records.

We are particularly concerned because the balances have grown substantially since our 1988 audit. At June 30, 1987, the amount of free balance, reserves, and encumbrances totalled \$5.4 million. In three years, it has grown to \$19.8 million. The balances include a supplemental budget allocation of \$500,000 for maintenance and operations of new buildings. However, Physical Plant did not charge any costs to this allocation.

Part of the balances results from reserves for utilities. However, as discussed in Section IV, use of these amounts is not well planned. Conservative encumbering practices have also added to the balances. This issue is discussed further in Section V. We understand that Physical Plant needs to maintain balances for operating reserves and asset replacement. However, we do not believe the department has developed an effective funding method or determined the appropriate level of reserves. On the other hand, Physical Plant has estimated the deferred maintenance needs of the University at over \$300 million. Management staff believe the amount is continuing to increase. The significant amount of deferred maintenance indicates that routine maintenance projects have not been completed over the years. Delaying this work could result in future damage to buildings and equipment.

## UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

The University administration is considering changing the funding method for Physical Plant. A November 1990 study recommended that University departments pay space occupancy fees. Physical Plant would collect the fees instead of receiving a state appropriation budget allocation. If this system is adopted, the various departments could negotiate the level of some discretionary services by Physical Plant, which do not adversely impact basic building systems and life safety issues provided. This proposal could make University departments more aware of the cost of services provided. It would also provide increased resources for Physical Plant when the University constructs new buildings which require additional services. However, detailed cost information, necessary to ensure that rental fees meet the cost of providing basic services, is currently not available.

We recommend:

- The University administration should establish Physical Plant's budget based on standard levels of service.
- Physical Plant should develop a plan for the use of residual funds.

The operating budget is also affected by the extent that services are charged to other departments. According to University administration and Physical Plant management, the Physical Plant budget should fund routine services provided to "support" units. As a general rule, support units are academic activities funded from state appropriations. "Nonsupport" units are activities funded from fees or other revenue sources.

We found that:

4. The University has conflicting definitions of support and nonsupport.

The University does not have an official record identifying support and nonsupport units. Physical Plant's listing of support and nonsupport is not consistent with other University records. We could not determine the basis for Physical Plant's listing. Physical Plant could use the records of the University's Office of Space Programming and Management to determine nonsupport units. These records, which identify the square footage of space for each department, are used in other University cost allocation procedures. The records categorize each department as support or nonsupport.

Physical Plant's Finance Division staff do not always use the Office of Space Programming and Management's records when preparing maintenance and repair bills, in part because they do not believe the records are completely reliable. As a result, in some instances, the amounts billed by Physical Plant differ from the Office of Space Programming and Management records. For example, Physical Plant listings identify Nolte Center as being 14 percent nonsupport, while the Office of Space Programming and Management records show it as 56 percent nonsupport.

## UNIVERSITY OF MINNESOTA - PHYSICAL PLANT OPERATIONS

Another problem is that the University does not have a formal definition of support and nonsupport. We question some of the classifications in the Office of Space Programming and Management's records. The University's budget request to the Legislature lists certain functions as "auxiliary enterprises" and states that these units are self-supporting operations. Examples include residence halls, food services, and intercollegiate athletics. We believe this implies that these functions are nonsupport and, as such, should pay all costs associated with their activities.

As an example of this concern, the Office of Space Programming and Management lists Williams Arena as a support activity, except for the concession areas. However, intercollegiate athletic programs are a primary user of the building. Even though the Athletic Department collects significant external revenues, it does not pay for the majority of Physical Plant services provided to the building.

This issue is further complicated in the repair area. University policy on billings for repairs to buildings shared by both support and nonsupport units is not clear. During fiscal years 1988 through 1990, Physical Plant did not bill any repair costs to nonsupport units which shared buildings with support units. The nonsupport portion of these major projects totalled \$120,000. The University needs to determine if repair projects will be billed to nonsupport units or funded in another manner.

We recommend:

- The University should develop a formal policy defining support and nonsupport activities.
- The University should establish an official record of support and nonsupport units.
- Nonsupport units should pay for the Physical Plant services they receive.

We believe the concerns about funding are also a problem in the maintenance area because:

5. Physical Plant does not have a policy defining routine and nonroutine services.

University departments should know when to expect various services. For example, carpet replacement could be defined as routine after a certain number of years. If a department requests earlier replacement, Physical Plant could bill them all or part of the cost. Without a well defined policy, Physical Plant could inappropriately charge departments for routine services. Conversely, Physical Plant could provide special services without seeking appropriate reimbursement from departments.

Physical Plant cites the development of a routine maintenance schedule as a top priority. This schedule will provide the basis for job scheduling

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in the zones. Management can also use this list to monitor work completed. However, Physical Plant still needs information on the cost of basic services.

We recommend:

- Physical Plant should develop a policy defining routine and nonroutine services for all divisions.

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IV. UTILITIES

In our 1988 audit report, we stated that fuel and utility costs caused the Physical Plant budget to be too volatile. As a result, the University Budget Office acted to protect the Physical Plant budget from fluctuations in fuel and utility costs. Physical Plant now manages utility costs separately from other activities. The department pays the expenses, and charges a fee to the users. Physical Plant pays the utility fees for support units from its own operating budget.

Physical Plant used part of the utilities revenue to establish asset replacement and operating reserves. The purpose of the asset replacement reserve is to provide funding for equipment replacement. Due to the uncertainty of future utility operations, Physical Plant has not attempted to build reserves for replacement of the heating plant.

We found that:

6. Physical Plant did not adequately plan for accumulating and using utility reserves.

Physical Plant has not established a plan for its asset replacement reserve, which amounted to \$2.3 million at June 30, 1990. It has not scheduled equipment replacement or repairs. Thus, it does not have adequate information to set reserve levels. In the future, Physical Plant will continue to manage certain assets, such as the steam tunnels. It could develop a replacement schedule and establish rates based on the expected life of these assets.

Physical Plant also has not planned for the accumulation and use of the utilities operating reserve. In addition, it has never determined an appropriate level for the reserve. At June 30, 1990 the operating reserve totalled \$2.5 million. In April 1991, Physical Plant used \$1.6 million of the utility operating reserve to make a balloon payment on an outstanding debt, and thereby return funds to the University's internal loan fund. The utility rates did not provide for an adequate accumulation of funds for this debt service payment. If the department had included a provision in the rates to amortize the balloon payment, additional funds would have been available to pay the debt.

We believe that Physical Plant needs an operating reserve to protect against unexpected increases in utility costs. By spending the entire reserve, Physical Plant is again vulnerable to rising utility costs. It will need to reestablish an operating reserve by adjusting utility rates.

We question other uses of the operating reserve. Physical Plant used the reserve to eliminate deficits in the utility accounts for support units.

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We found that:

7. Nonsupport customers could be subsidizing the utility costs of support units.

During fiscal year 1990, Physical Plant used \$1.3 million of the operating reserve to fund deficits in the utility budget for support units. We question the use of reserves to fund deficits for certain utility customers. An operating reserve should provide additional resources when heating plant costs exceed estimates included in the established rates. Physical Plant's practice does not treat nonsupport and support units equally. Nonsupport units cannot use the reserves to fund their deficits.

Physical Plant also treated nonsupport customers inequitably when it collected \$500,000 more than anticipated during fiscal year 1990. It attributed this amount to less than expected line loss, which is the amount of steam lost between the heating plant and buildings. Physical Plant credited the additional revenue to the budget for support units. We believe the amount should have increased the operating reserve, or been credited to both support and nonsupport units. Both support and nonsupport units contributed the additional funds, but the total amount was returned to the support units.

Finally, Physical Plant may have overcharged nonsupport units because of two units of measure. According to Physical Plant staff, buildings have different types of meters. Some have steam meters which record the quantity of steam entering the buildings. Others have condensate meters which measure steam exiting the building. Utility Division staff stated that the amount of steam lost in a building due to using steam for humidification or sterilizing is significant. This steam loss is not measured when condensate meters are used. Staff also said that most steam meters are located in buildings occupied by nonsupport units. We could not quantify the amount, if any, of additional collections due to differences in meters. We think that Physical Plant should find a method for equalizing rates if the difference in measurement is significant.

We recommend:

- The Budget Office and Physical Plant should determine the appropriate level of capital and operating reserves. These amounts should be used in the rate calculation.
- Physical Plant should limit the use of the operating reserve to unanticipated costs in the heating plant.
- When collections exceed estimates, Physical Plant should credit both support and nonsupport units.
- The department should determine the effect of using two different units of steam measure, and adjust steam rates if significant.

V. REPAIR AND REPLACEMENT

The University has a serious deferred maintenance problem. In our 1988 report, we stated that the level of deferred maintenance and the absence of a comprehensive review of building conditions constitutes a serious financial management weakness. In 1989, the Legislature requested the state Department of Finance to develop a comprehensive report on the building conditions of the higher education systems. Physical Plant staff completed an assessment of building conditions on the Twin Cities campus. They developed a detailed list of projects with an estimated cost exceeding \$300 million.

The University has made some progress in addressing our previous concerns. It has a prioritized list of projects and a method for monitoring the use of funds. However, continued efforts are necessary to eliminate the deferred maintenance problem.

We found that:

8. The University does not have a long-term funding plan for deferred maintenance projects.

The Legislature provides some funding for University repair and replacement projects through a separate appropriation allocation. In fiscal year 1990, the University repair and replacement allocation totalled approximately \$9 million. The University administration distributed \$7.3 million of the allocation to Physical Plant for the Twin Cities campus. Under University policy, Physical Plant must use these funds for previously identified and prioritized projects.

Given the extent of the University's deferred maintenance, it must explore an alternate funding source for repair and replacement projects. Failure to complete these projects could permanently damage buildings.

We recommend:

- The University should develop a long-term funding plan for deferred maintenance.

Physical Plant uses repair and replacement funds on its highest priority projects. It encumbers the total cost of a project when authorized. However, because many projects continue for several years, valuable encumbered resources may remain idle during that period.

We believe that:

9. Physical Plant's encumbrance practices may unnecessarily limit the use of funds.

Table V shows the expenditures and encumbrances against open repair and replacement projects as of June 30, 1990. The summary includes projects

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funded from the special repair and replacement account as well as other sources. The June 30, 1990 balance includes \$7.3 million in encumbrances in the special repair and replacement account. As can be seen, many funded projects remain open for several years.

Table V  
Repair and Replacement  
Status of Open Projects  
June 30, 1990

<u>Year of Authorization</u>	<u>Authorization Amount</u>	<u>Expenditures</u>	<u>June 30, 1990 Balance</u>
FY 1988	\$ 2,714,200	\$1,352,880	\$1,361,320
FY 1989	2,946,787	995,033	1,951,754
FY 1990	<u>7,672,593</u>	<u>2,156,923</u>	<u>5,515,670</u>
Total	<u>\$13,333,580</u>	<u>\$4,504,836</u>	<u>\$8,828,744</u>

Source: Physical Plant's June 30, 1990 Repair and Replacement *Quarterly Progress Report*.

Physical Plant must ensure that funding is available before authorizing projects. However, encumbrance practices which are too conservative may result in an inefficient utilization of resources.

We recommend:

- Physical Plant should free resources by phasing in encumbrances as funds are needed for long term projects.

The University administration may use repair and replacement funds to pay for emergency projects. For each year, a portion of the state appropriation allocation is set aside for emergencies. Individual project expenditures from this allocation are not reported to the Board of Regents unless the cost exceeds \$100,000. We believe that, in some instances, the administration did not prudently use these funds.

For example:

10. Significant repair and replacement funds were used for repairs to a University showboat.

For at least the last 15 years, Physical Plant has used portions of its repair and replacement appropriations for repairs to the showboat. Repairs have been necessary in part because the showboat has developed leaks and periodically sinks.

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The Theater Department holds plays and other events on the showboat. The University considers this activity academic related, and as such the showboat is categorized as a support unit. As a result, the Theater Department is not billed for the cost of repair services. We question the use of repair and replacement funds in this manner. Physical Plant disbursed approximately \$130,000 in fiscal year 1990 on five different repair projects for the showboat. It estimates that another \$9,000 is necessary to complete the projects. Since no individual project exceeded \$100,000, University management did not report the expenditures to the Board of Regents. We believe the University could find better uses for its repair and replacement funds. We believe the showboat repairs were costly and we question whether the University has realized sufficient benefits to justify the cost.

We recommend:

- The University should discontinue funding showboat repairs from the Physical Plant budget.

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### VI. RATES CHARGED FOR SERVICES

As part of its new accounting system, the University purchased a job costing system. Physical Plant will use the system to monitor the cost of individual jobs and simplify the billing process. Management believes the system will provide better financial information and eliminate different billing methods.

The new accounting system should make the billing process more efficient. However, Physical Plant needs to review the accuracy of its rates charged for services. Typically, the cost of a job includes direct labor, materials, and overhead. The current rates were developed several years ago and have not changed. In our 1988 report, we questioned the calculation of overhead rates.

In our current audit, we found that:

11. Physical Plant has not reviewed the propriety of overhead rate calculations and the rates are not based on current cost estimates.

The purpose of overhead charges is to recover costs indirectly associated with a job. Examples include vacation, training, supervision, inventory management, and support services. Overhead is commonly added to labor and material charges. To establish the rate, management must estimate costs and billable units.

Overhead rates differ between divisions. The Custodial Division has an overhead rate of 70 percent, while Vehicle Maintenance adds 45 percent to its jobs. The shops charge 65 percent for civil service workers. The difference could result from varying costs between the divisions. However, Physical Plant cannot document the basis for the various labor overhead calculations. The rates were established by a former employee. Physical Plant is unsure of their adequacy because it has not compared recoveries to actual costs.

The shops add an arbitrary 20 percent surcharge to material costs to recover overhead. Again, there is no documentation of the basis for this surcharge. Physical Plant needs to determine the purpose of the materials charge. It can then develop an appropriate billing amount based on costs. Physical Plant's rates generally do not include a provision for equipment usage. One exception is the Custodial Division, which includes a five percent surcharge for equipment costs. However, this rate is not based on historical or estimated replacement cost.

Overall, the Physical Plant rates are not based on current overhead costs. In addition, Physical Plant's new organizational structure may result in different overhead costs. Management needs to determine all overhead costs and develop an equitable method for distributing them. It needs to include equipment costs in the surcharge calculation.

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We recommend:

- Physical Plant should review the calculation of overhead rates.
- The department should periodically compare recoveries to actual costs, and adjust rates as necessary.

VII. INVENTORY CONTROLS

Physical Plant maintains an inventory of repair parts, materials, and custodial supplies. Each maintenance shop is responsible for its inventory. The Custodial Division stores supplies in approximately 35 locations throughout the Twin Cities campus. Because the department manages a large volume of small dollar items in numerous locations it must determine the extent of necessary inventory recordkeeping.

In our 1988 audit we reported significant internal control weaknesses over inventory. Our concerns focused on recordkeeping, safeguarding assets, and separation of duties. These weaknesses still exist.

First, we found that:

12. Inventory recordkeeping is inadequate.

After our last audit, the maintenance shops began developing various inventory systems. Management determined that these efforts were not meeting its objectives and discontinued the projects. In addition, the shops did not take annual inventory counts.

Management wants to develop one system for inventory control, job scheduling, and equipment scheduling. Management intends to hire a consultant to plan and design such a system. Until a system is in operation, Physical Plant will have difficulty detecting inventory shortages or thefts.

Computerized systems improve inventory management in several ways. Management can compare recorded inventory to physical counts to detect misuse of items. In addition, such systems can automatically generate purchase orders when stock levels drop below the desired quantity. They can also calculate average prices, and enable management to review usage and identify obsolete items.

We also found that:

13. The shops have not adequately restricted access to inventory.

Limited access to inventory is necessary to ensure proper safeguarding of assets. The level of security depends on the nature of inventory. However, the risk of errors or irregularities increases with the number of people who have access to items. Currently, in most shops, workers pick up materials.

We believe inventory supervisors should issue items to workers. Project supervisors should authorize material requisitions. In addition, workers should sign documents acknowledging receipt of the materials. Such procedures would provide better assurance that goods are used for their intended purpose.

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Finally, we found that:

14. Duties are not adequately segregated in inventory centers.

In most shops, the general foreman is responsible for both purchasing and receiving goods. Separation of these duties would strengthen internal controls. Physical Plant has a central receiving area, but staff in this area do not count the goods delivered. Instead, they send the items to the appropriate division. The general foremen count the items and send a receiving report to Physical Plant's Finance Division. If the staff in the receiving area counted items, Physical Plant would have an independent verification of the quantity received.

The new organizational model presents management with several inventory challenges. It will have new locations, and different procedures for stocking items. When establishing these locations, we believe management should review controls over purchasing, safeguarding, and recording inventory items.

In summary, we recommend:

- Physical Plant should implement a uniform perpetual inventory system, insofar as practical.
- The department should restrict access to inventory items.
- Someone independent of the purchasing function should verify the quantity of goods received.

VIII. PERSONNEL ISSUES

The University did not renew employment contracts with two former administrators of Physical Plant. Mr. William Thomas was the former Associate Provost for Physical Plant and Mr. Charles Bailey was the former Director of Physical Plant.

We found that:

15. The University central administration negotiated settlement agreements with these individuals which exceeded the requirements of the personnel policy.

We question the compensation portion of these agreements which exceeded University policy. The University did not receive additional services to justify the additional compensation. We raised questions about similar settlements in our October 1989 audit report on the offices of the president and selected vice-presidents. Those agreements placed former University administrators on administrative leave. In response, the Board of Regents established a policy limiting administrative leave and controlling employee separation settlements. The agreements with Mr. Thomas and Mr. Bailey were negotiated prior to the Board of Regents' adoption of revised policies.

In August 1989, the University reached a settlement with Mr. Thomas agreeing to pay him two years salary which totalled \$177,000. In accordance with the University's professional/administrative policies, the University was obligated to give Mr. Thomas a twelve month notice of "non-reappointment" to an annual contract. The earliest the University could have ended employment with Mr. Thomas in accordance with the policy was June 30, 1991. However, the settlement agreement terminated his employment in August 1989, and provided salary and retirement, health and dental benefits through August 1991, as well as attorney fees of \$2,500 and discount tickets on University events.

Under a similar settlement agreement, Mr. Bailey received compensation which exceeded the terms of the professional/administrative policy. He was placed on leave of absence and paid full salary from August 11, 1989 to June 30, 1990. The University agreed to continue payments after June 30, 1990 at one-half salary. These payments were to last until Mr. Bailey was employed, but not more than six months. Mr. Bailey informed the University that he accepted new employment on September 15, 1990. In addition, the University agreed to pay the usual fee for an "outplacement" agency. In accordance with the professional/administrative policy, the University was obligated to pay Mr. Bailey's salary through June 30, 1990. However, he received payment for an additional two and one-half months and an employment agency fee.

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Another payroll concern relates to heating plant employees. We found that:

16. Heating plant employees are paid for 80 hours regardless of the number of actual hours worked.

Physical Plant staff stated that this has been a long standing practice. The heating plant must be staffed continuously. Therefore, staff may work less than 80 hours some pay periods, and more than 80 hours other pay periods. For simplicity, the employees receive pay for 80 hours each pay period. Physical Plant does not document the actual hours worked.

Physical Plant does not have authority to pay employees in this manner. The bargaining agreements and University policies require payment for actual hours worked. In addition, the bargaining agreement requires overtime when employees work more than 40 hours per week. Physical Plant is avoiding overtime payments under their current practices.

We recommend:

- Physical Plant should pay heating plant employees for actual hours worked.

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**REPONSE OF THE  
UNIVERSITY OF  
MINNESOTA**





UNIVERSITY OF MINNESOTA  
TWIN CITIES

Physical Plant Operations  
200 Shops Building  
319 15th Avenue S.E.  
Minneapolis, Minnesota 55455

July 1, 1991

Representative Ann Rest, Chair  
Legislative Audit Commission

Members of the Legislative Audit Commission:

The Physical Plant Management Team appreciates the opportunity to respond to the Legislative Auditor's report on the University of Minnesota Physical Plant Operations. We find this report to be a balanced assessment of the current situation in Physical Plant. Credit is given in the report to the progress management has made in recent months as well as accurately identifying the challenges ahead. We are reassured by the auditor's findings that we have "articulated a reasonable plan for improving the cost-effectiveness, customer satisfaction, and financial controls of the Physical Plant organization." We want to assure the members of the Legislative Audit Commission, the University Community, and the general public that as an organization we are well on our way to responding to the challenge.

By the very nature of the audit process, attention is all too often focused on the deficiencies of organizational operations. In light of this tendency, we are particularly appreciative of the Legislative Audit Team's acknowledgement of management's progress in solving problems in Physical Plant:

- ⊙ The establishment of a management team that is working towards common goals and is committed to change;
- ⊙ A major organizational restructuring in process that addresses the concerns identified in the 1988 Legislative Auditor's report;
- ⊙ Internal and external organizational relationships have been improved;
- ⊙ Internal communications have improved as well as relationships with external groups such as the Board of Regents, University departments and organized labor;

- ⊙ Management is appropriately focusing on addressing the fundamental flaws in the organization's control environment and accounting;
- ⊙ The University is developing a new accounting system;
- ⊙ Management has laid the foundation for improved planning and scheduling of work through the development of shop backlog reports and daily workplans;
- ⊙ A new contract with the Building Trades was negotiated that improves consistency among the work practices of individual trades and increases management's flexibility; and
- ⊙ Transportation systems have improved with further cost reductions anticipated with implementation of the new organizational structure.

In short, the Legislative Audit Team has found that some important foundations have been laid for future change. Nevertheless, the Physical Plant Management Team acknowledges that change has been slow and many of the inefficiencies which were identified in the 1988 audit report remain. While we are prepared to respond in detail to each observation and recommendation presented in the 1991 followup audit, we feel that there are two primary issues that deserve attention: the cost of Physical Plant's services and the inadequacy of internal financial controls.

#### Physical Plant Costs

The Physical Plant Management Team, which became operational in November of 1990, acknowledged the problems associated with the Physical Plant organizational structure and its financial control systems and began to develop a plan to correct the problems. In February of 1991 we proposed to our employees, customers and the Board of Regents a comprehensive reorganization plan to improve Physical Plant's delivery of services and cost-efficiency. The Facilities Management organization is the vehicle for accomplishing this goal. The primary objectives of this reorganization are:

- ⊙ To deliver more efficient/cost-effective service to our customers;

- ⊙ To provide a structure for building-based budgeting and accountability; and
- ⊙ To maintain and upgrade the physical assets of the University.

The Facilities Management organization is a decentralized zone concept which focuses on effective management of buildings and facilities through the use of employee work teams and improved work planning and scheduling systems. Decentralization will ensure that resources required to maintain facilities are located within geographic zones thus providing improved communication and coordination between customers and service providers. In each zone a Facilities Supervisor will be the central point of accountability. We believe this represents a significant improvement over our current highly centralized organization.

The idea of managing facilities in this manner is not a new concept. Facilities management organizations in both the public and private sectors have successfully used this decentralized team approach for many years. We are confident that we will successfully implement this approach to manage facilities at the University of Minnesota consistent with industry standards.

In addressing the issue of Physical Plant costs, we would be remiss in not acknowledging the considerable discussion in the Legislative Auditor's report about the issue of wages paid to our Trades and Teamster employees. While the report identifies numerous cautions with respect to the comparability of data used for the wage analysis it is indeed likely, if history repeats itself, this issue may be the focus of media attention. We believe this is unfortunate. There is indeed a story to be told about Physical Plant but it is not the fact that prevailing wages in the Minneapolis-St. Paul area are higher than those paid in Ames, Iowa; Athens, Georgia; or Houston, Texas. Regardless of whether or not the appropriate comparison is other higher education institutions or the Minneapolis-St. Paul labor market, we believe that it is not the wages we pay our employees but rather the inefficiencies in current work assignment and scheduling systems that contribute to our high costs and lower levels of productivity. These are the issues management is focusing on to achieve our objectives--improved service delivery and cost-efficiency.

Internal Controls

The auditor's findings in the area of Physical Plant's internal controls is consistent with the assessment of the Management Team. A key weakness is the incomplete status of financial data on Physical Plant Operations. This will be corrected with the implementation of the University's new accounting system scheduled to be on-line November 1991. Concurrent with this implementation, a building-based budgeting approach will be implemented which is designed to maximize the use of funds for maintenance and operations and establish accountability for resource management within the zones.

The building zone concept, with the close proximity of service to the customer, will be an effective vehicle for establishing the programmatic use of all funds, including our Repair and Replacement funds. The Management Team found that academic priorities were not adequately addressed in establishing the use of these funds. As a result, we have begun a reassessment of funds committed to long-term encumbrances to ensure that limited funds are appropriately allocated. The Management Team acknowledges the need to develop a long-range deferred maintenance plan that incorporates academic priorities and an effective multi-year financing strategy for presentation to the Legislature.

While much progress has been made in addressing the Physical Plant concerns identified in the 1988 Audit Report and numerous efforts are underway for further improvement, the ultimate success of our organization is dependent upon the individual contributions of each and every employee in Physical Plant. It is in recognition of this fact that the Management Team has made a concerted effort to be open with our employees and listen to their concerns. We firmly believe that employee participation is essential to improving our management systems and cost effectiveness. While we recognize that the magnitude of change that we are proposing has generated a great deal of anxiety for Physical Plant employees, they should be commended for their willingness to reserve judgment on these changes and give us an opportunity to succeed.

We recognize that the process of change in Physical Plant requires more than the commitment and participation of our management team and our employees. Our ability to change our culture and the "old way of doing business" is also dependent upon the support, understanding and cooperation of the Board of Regents, University administration faculty and staff, as well as representatives of organized labor. We would like to thank all of these groups for their willingness to work productively with us over the past months to begin the process of change in Physical Plant. We are confident

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that in return, the University can expect to see an organization that is responsive to the needs of faculty, staff and students and one that operates in a manner consistent with our mandate to effectively maintain the assets of the University in a cost-efficient manner.

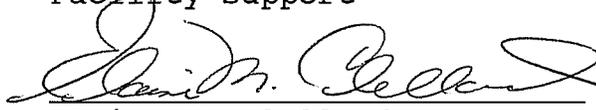
We would like to thank the Legislative Audit staff for the comprehensive work they have done in the followup audit, for their openness to our suggestions, observations, and concerns, and for their willingness to incorporate our response in the final audit report.

We look forward to meeting with the Legislative Audit Commission on July 1 at which time we will be prepared to address any specific questions you may have.

Sincerely,

  
Kirk Campbell  
Facility Support

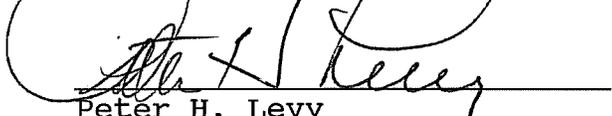
  
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cc: Board of Regents  
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Sr. Vice President Len Kuhi  
Executive Director Barbara J. Muesing  
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