

## **SUMMER HOUSING TURNOVER MAINTENANCE CONTINUOUS IMPROVEMENT PROJECT**

Date:

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Sponsored by:

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Victor J. Atherton

Team Leader:

Gregory Gibson

Dates of Meetings:

The team began to meet weekly in early January. The team met on a mostly weekly basis through the summer as well, although there were regular, various sub-team meetings to provide update and address and resolve specific issues.

List of team members:

Victor Atherton  
David Bradbury (Student intern)  
Shelly Steele (Student intern)  
Robert Dale  
Robert Dubord (Dept of Residence Halls)  
Gregory Gibson  
Ronald Jarquin (UNICCO)  
Mark Morgan (UNICCO)  
Robert Redick (Dept of Residence Halls)  
Michael White  
Johnny Williams

Team Mission Statement:

To develop and implement a process that will reduce overall costs, increase efficiencies, and maintain customer satisfaction.

How Will Success Achieving the Mission Be Measured?

Physical Plant tracks key measurement data such as the type and volume of work orders for the week of opening, overall cost of the summer turnover exercise, and the number of service requests per 100 students.

A matrix has been created, allowing the team to track time/labor/materials associated with each cost center. In addition, the team has collaborated on producing a Gantt chart to plan and track maintenance functions throughout the cycle.

Current Status of Team:

This CI effort is an ongoing annual Plan/Do/Study/Act cycle. The team will re-convene in early January to design the Summer 2005 turnover effort.

A Brief Description of the Project:

There is a common goal to accomplish a large amount of building maintenance during the course of the summer in all of the student housing facilities. However, there is also a simultaneous need for space to house students for summer school, various conferences, and seminars. There could also be any number and magnitude of small and large-scale maintenance, renovation and custodial projects scheduled for accomplishment in the student residential facilities during this same period.

Our annual exercise is the refinement of an organized process with measurable objectives to address the complex schedule of building maintenance, large-scale projects, and the needs of the Department of Residence Halls.

Reason Selected:

After the housing turnover process of Summer 1998, there were several dissatisfied stakeholders. Employees from the Physical Plant, UNICCO, and the Department of Residence Halls, identified several areas of concern. This “team” of stakeholders agreed that all areas of concern could be eliminated through a better planning, measurement, and process implementation.

The team also agrees to continually refine our processes with regards to all measures, and to remain vigilant to budgetary compliance.

Situation Analysis:

In the early planning stages of the Summer 2001 exercise, the team wanted to develop a “new” way to do business. The Summer 2001 cycle is considered our benchmark year for many of the current measures we are utilizing; however we have collected pertinent data in some areas that predates this cycle for reference purposes.

As time has moved forward, we have been able to refine many of these measures, and discovered new areas of measurement as we look to continuously improve our processes.

Data Collection:

Our work order system is our primary tool for gathering the data in the areas of preventive maintenance accomplishment, the volume/type of service requests, overtime man-hours utilized and customer comments related to maintenance.

These measures, as well as budgetary information, and customer comments related to environmental services (which are tracked by UNICCO) are our some of the indicators of our success.

In addition, one student intern, with a background in statistical measurement, was hired to help collect and analyze data.

Data Analysis:

We canvassed several University departments when looking for student interns to assist with the data collection and analysis. Last year's student intern, David Bradbury, selected Michelle Steele to be his replacement for the summer. Shelly and David began in early spring collecting data to use as standards in a Gantt chart.

The student intern is instrumental in the collection and analysis of hang tag data, and analysis of time/labor/materials charges from the work order matrix. The student intern also chaired sub-meetings with physical plant and UNICCO to fine-tune operational issues. In addition, the intern compared standard times and actual times to ensure the process was on track.

Weekly team meetings were also held involving the stakeholders. Each stakeholder provided updates to ensure the field personnel were clear on assignments, there was progress towards deadlines and milestones, and to resolve issues. Root causes for problem areas and situations were discussed, with plans and schedules adjusted accordingly. This was a mini Plan/Do/Study/Act cycle to rapidly identify and respond to issues.

Goal:

Gains were achieved in several key areas with the Summer 1999, Summer 2000, Summer 2001 and Summer 2002 processes. For the Summer 2004 process, additional goals include the following:

- Begin the planning process for next year's exercise in early January, and the development of building schedules well in advance of the summer housing turnover process.
- Continuing to establish budgets for each functional area, and assign budget ownership for each component.
- Review the summer turnover process and continue to think beyond current paradigms.
- Refine the hang tag used by the inspectors.
- Use of a Gantt Chart to schedule the various components of jobs to be accomplished. This enhancement to our processes provided us an effective tool for keeping project milestones on track. It also provided us an opportunity to understand the costs associated with the project at its inception, which provided us with a budgetary benchmark.
- In-depth analysis of painting needs and contractor coordination.
- UNICCO to continue their satisfaction graph.

Actions:

From previous summer exercises, extraordinary gains had been made. There were, however, some areas of concern.

How can we identify and most impact the major cost centers? What is the “acceptable” level of maintenance? How efficient can we make the summer program?

Through regular brainstorming sessions, the team began to entertain alternative ways to address the summer exercise. A new paradigm was developed that included the following enhancements and changes:

- The Department of Residence Halls, Physical Plant, and UNICCO developed and identified maintenance and custodial “standards.” These standards would drive the maintenance and environmental services labor effort.
- Physical Plant and UNICCO inspection teams were developed and trained in the agreed-upon standards, which had the final approval of the Department of Residence Halls. These inspection teams were crucial, in that the inspectors would identify only those rooms that needed attention, and direct the proper skill set to address the specific need. If a returning student still had dissatisfaction with the room, a work order would be generated to address the specific concern.
- Major cost centers were identified. The maintenance labor effort was very specifically deployed via hang tag. Cleaning and furniture removal were specified into very specific and functional teams. Touch-up painting of rooms, hallways, and doors was outsourced to a contractor.
- A new work order management system was brought on-line. This allowed us to capture a greater level of information regarding requests for service upon the return of the students.
- The group utilized Gantt charts to better manage the CI process. The Gantt charts were created previous to the summer exercise and were continually updated. These charts dictated where and when each process was to occur.
- Hired a full-time painting inspector to monitor the painting contractor.

Physical Plant, UNICCO, and the Department of Residence Halls worked together to coordinate operations and maintenance activities for the summer. The Department of Residence Halls developed a matrix listing all activities at the student residential facilities, milestone dates, and the area of anticipated need regarding services. Through the work order management system, there was specific line-item accountability per task and building to manage these areas.

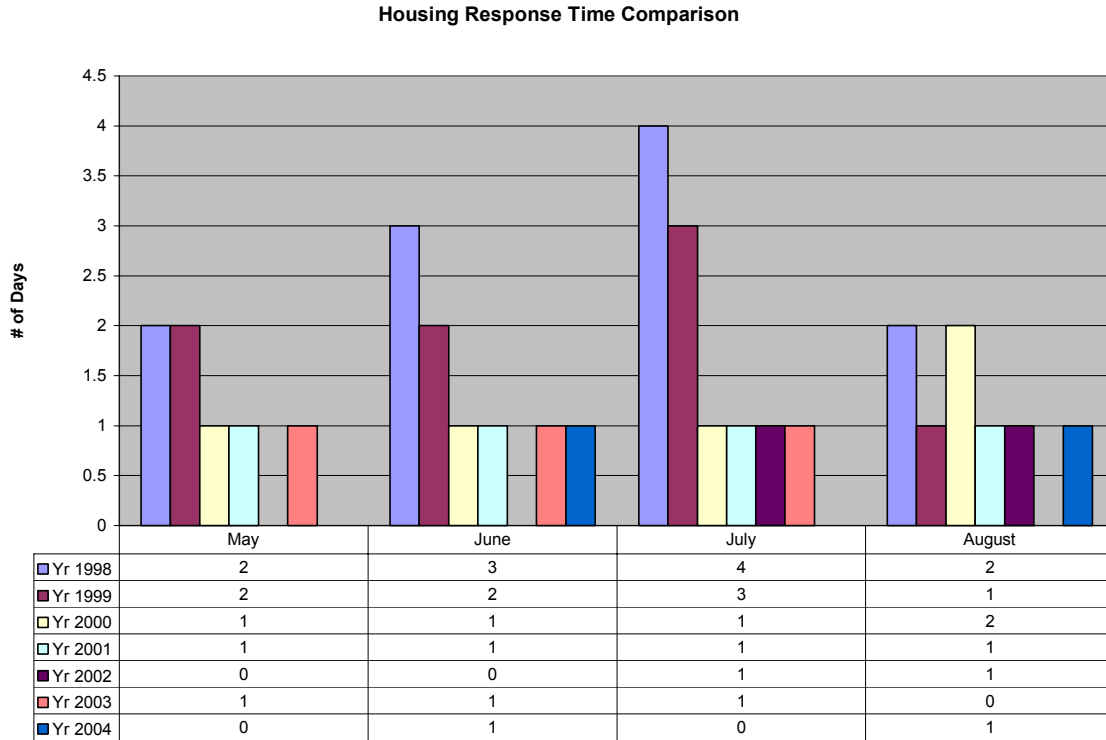
#### Evaluation:

Implementation of our Summer 2004 Housing Turnover CI Process began on May 15, 2004.

Throughout the summer housing exercise, there are requests for routine maintenance from building occupants, such as summer school students, attendees for conferences and camps, new students, and residence masters and coordinators. Accordingly, there are requests for maintenance, not associated with the housing turnover, during the business day.

One measure of team success in this area is the response time for requests for service.

The chart below illustrates our success in addressing the needs of the building occupants during the accomplishment of the summer process. Although Summer 2001 is considered our benchmark year, we have listed additional data collected for several additional years in this area.



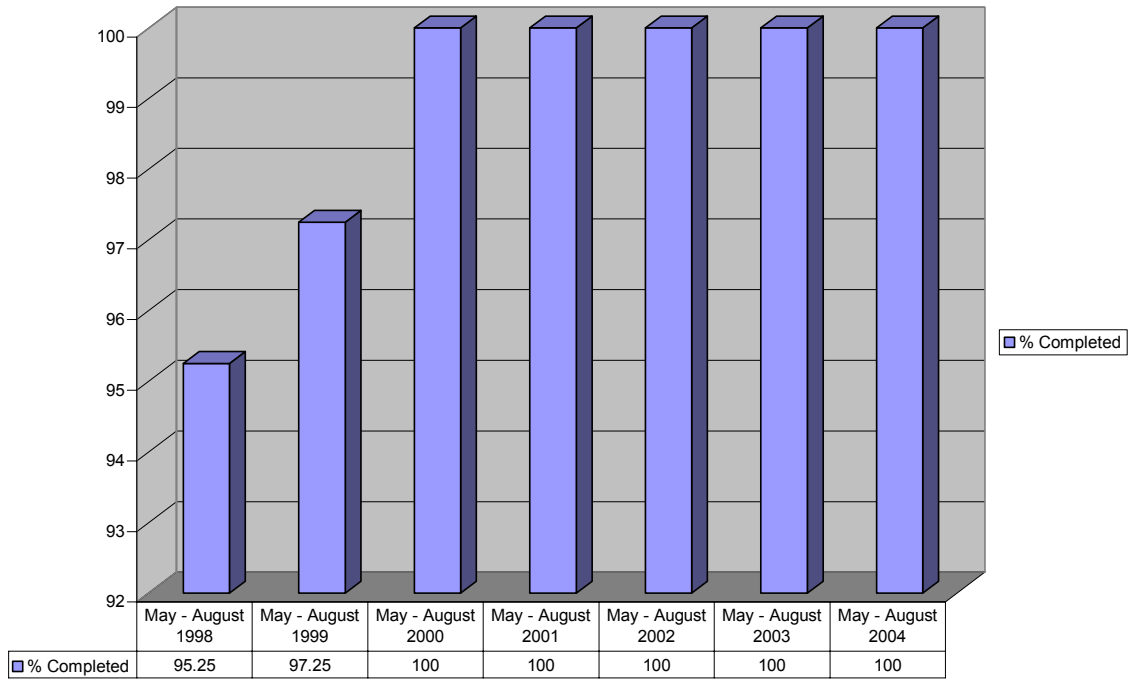
For comparison purposes, in May and July 2004, response time decreased (one day) when compared to May and July 2003. Response time for June 2004 remained the same (one day) when compared with June 2003. Response time for August 2004 increased 100% (one day) when compared to August 2003.

In May–August 2004, response time decreased 50% when compared to this same time frame for May–August 2001, our benchmark year.

There is also a schedule of tasks to complement our preventive maintenance program. Proper attention to building preventive maintenance tickets has a positive long-term impact on the efficiency and life expectancy of building components. It also has the potential to minimize the number of requests for maintenance from returning students.

The following chart indicates our success in addressing the needs of the buildings during the accomplishment of the summer process.

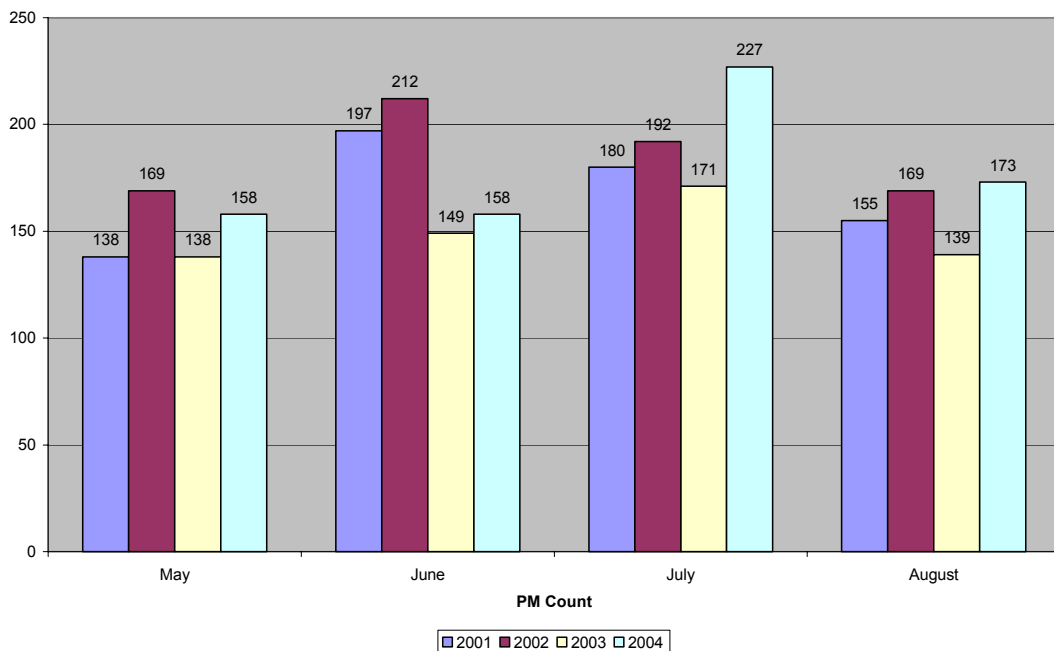
**Rate of PM Completion**



Although Summer 2001 is considered our benchmark year, we have listed additional data collected for several additional years in this area.

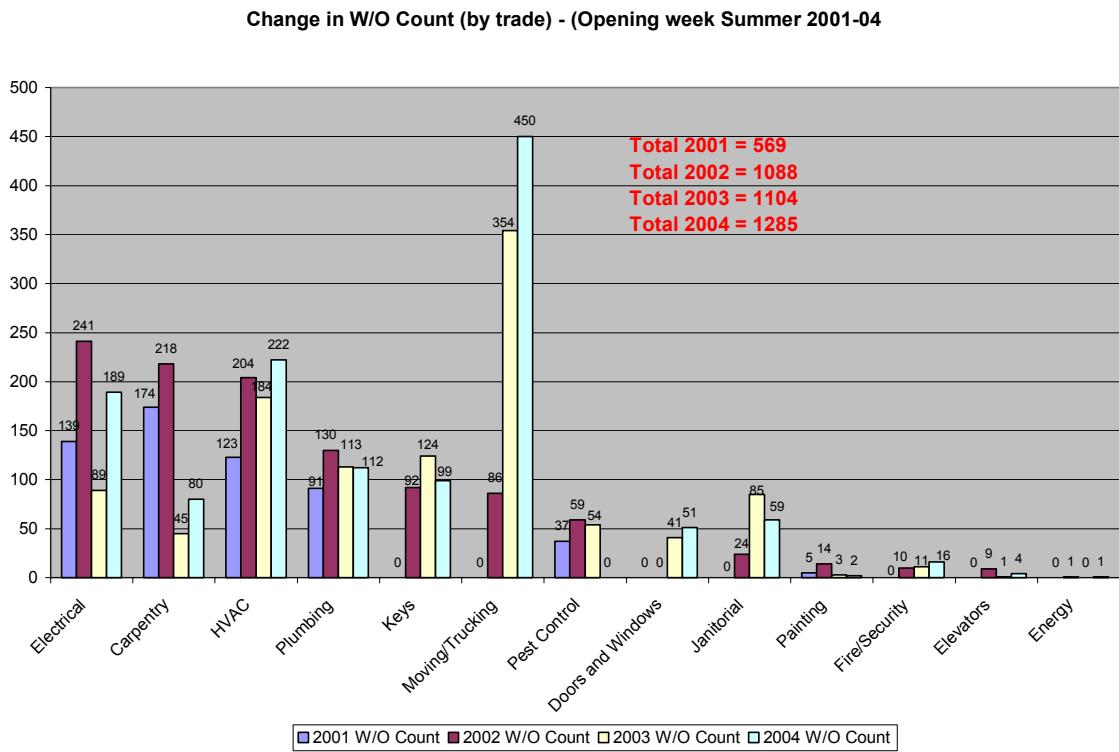
Our rate of PM accomplishment during Summer 2004 was 100%. The Summer 2004 exercise maintained gains developed from previous summer exercises, including Summer 2001, our benchmark year.

**PM Work Order Count**



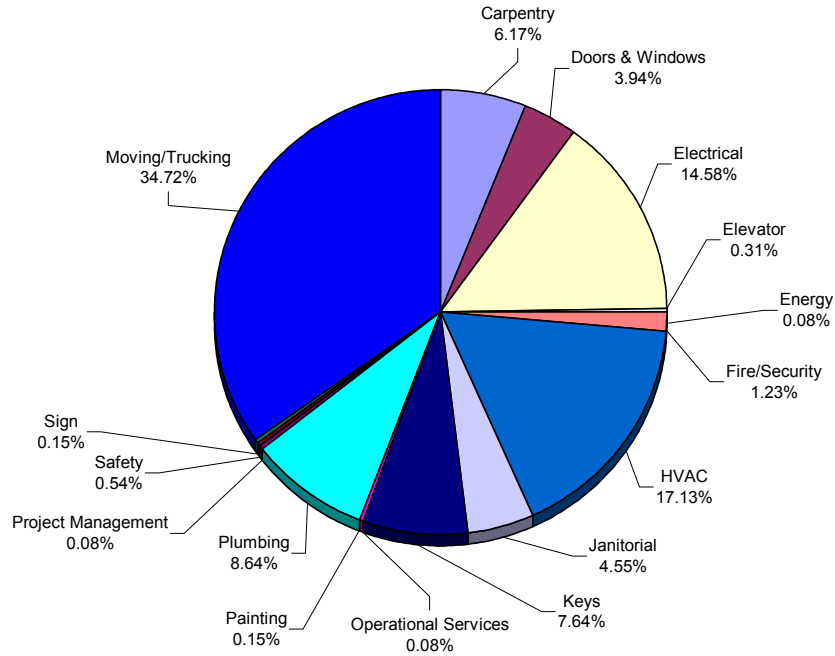
The total number of PM Work orders rose from 597 in 2003 to 716 in 2004. This represents an increase of 20%. In 2001, our benchmark year, PM work orders totaled 670. Therefore, work orders in 2004 only represented an increase of 7% from our benchmark year.

During the Summer 2004 Housing Summer Turnover exercise, the formal student move-in began on August 21, 2004. We developed a bar chart to compare the volume of requests for service received from Summer 2004 with the previous three cycles (Summer 2003, Summer 2002 and Summer 2001, our benchmark year in this area). In addition, a pie chart was creating to identify the percentage of work orders attributed to each trade. We have noticed a significant increase in the number of moving/trucking calls.



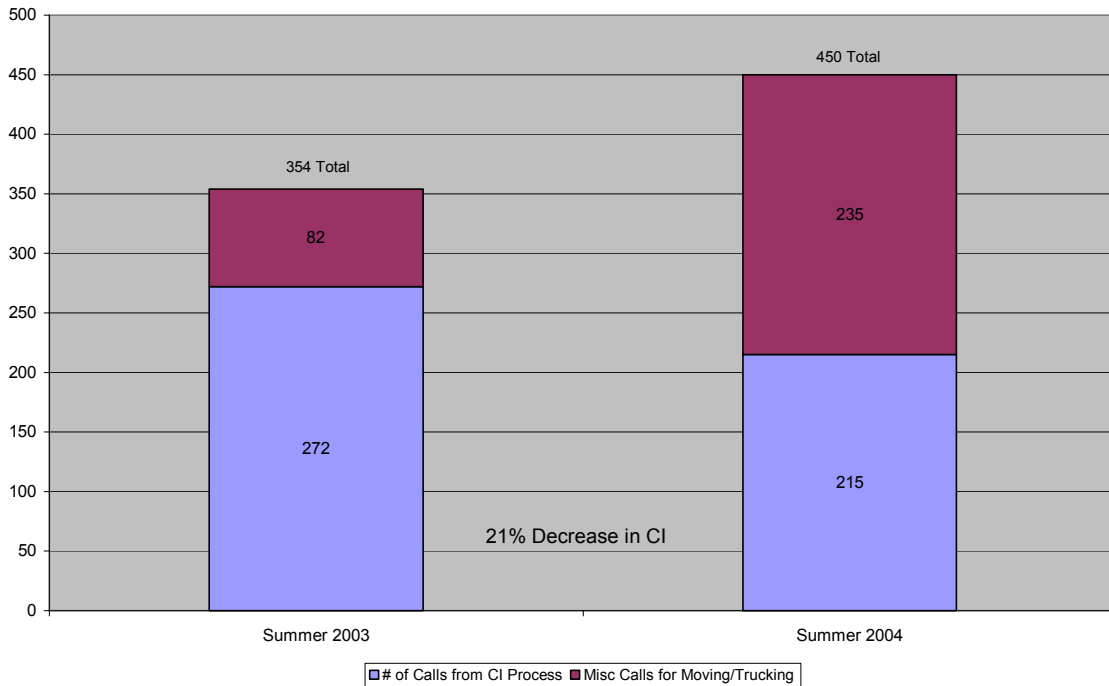
Total work orders have continued to increase each year. As shown, the moving/trucking function had the most requests for service, followed by the HVAC maintenance trade.

**Types of Work Orders - Pie Chart**



We performed an analysis of the types of requests for service received for the moving/trucking function:

**Trucking Calls Related To CI Process - Opening Week Summer 2003-04**

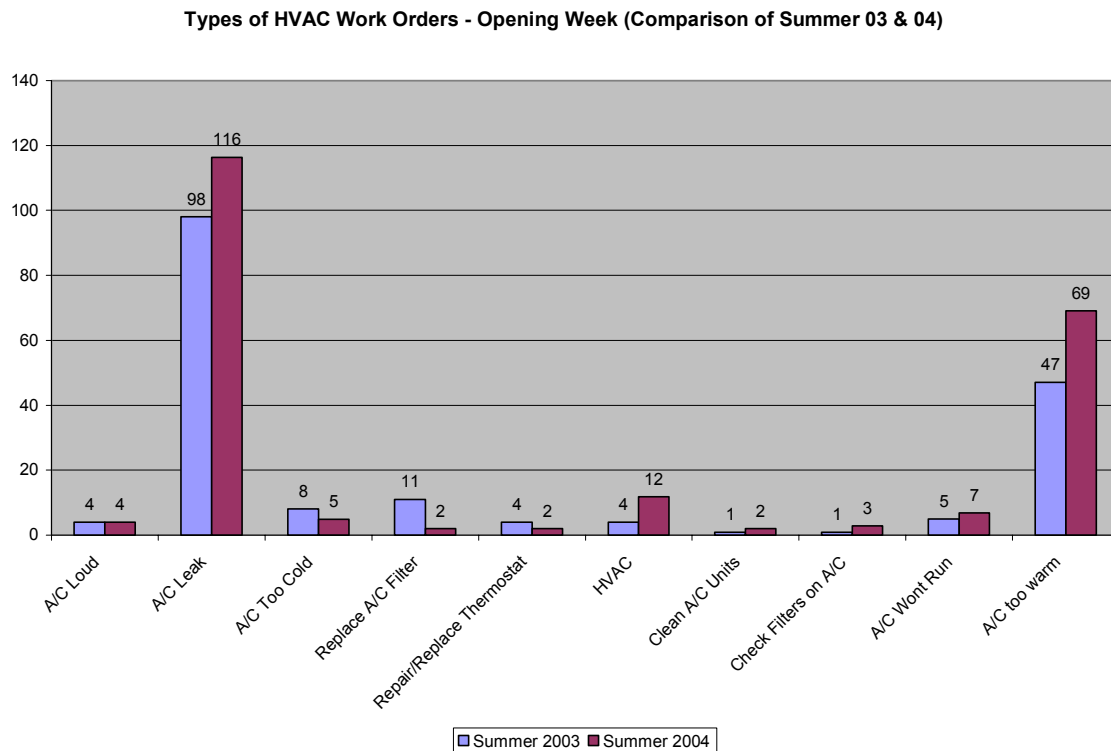


There was an increase of 27% (96 w/o) from Summer 2003 to Summer 2004. Using data from the work order management system, we were able to determine how many of these requests for service were related to processes addressed by our continuous improvement process. (We were unable to determine the specific number for Summer 2002). However, history indicates that early-arriving students sometimes “borrow” furniture from students/student rooms that are as yet unoccupied, and many students call for the removal of furniture so they can install private “lofts.”

In addition, process improvements were made in the collection of data. It is possible that there was not a drastic change in the decrease of CI Moving and trucking orders and the increase in miscellaneous orders. Likely, we were better able to capture which orders belong where in our data management system.

According to UNICCO, the average cost of a single work order was \$11.90. In addition, the cost of furniture is important in the summer analysis. The cost of a desk is \$340 and the price of a chair is \$99.

From the maintenance standpoint, the HVAC trade had the most frequent maintenance-related student calls during the eight-day opening cycle. We developed a bar chart to compare the volume of requests for service received from Summer 2004 with the previous cycle from Summer 2003:

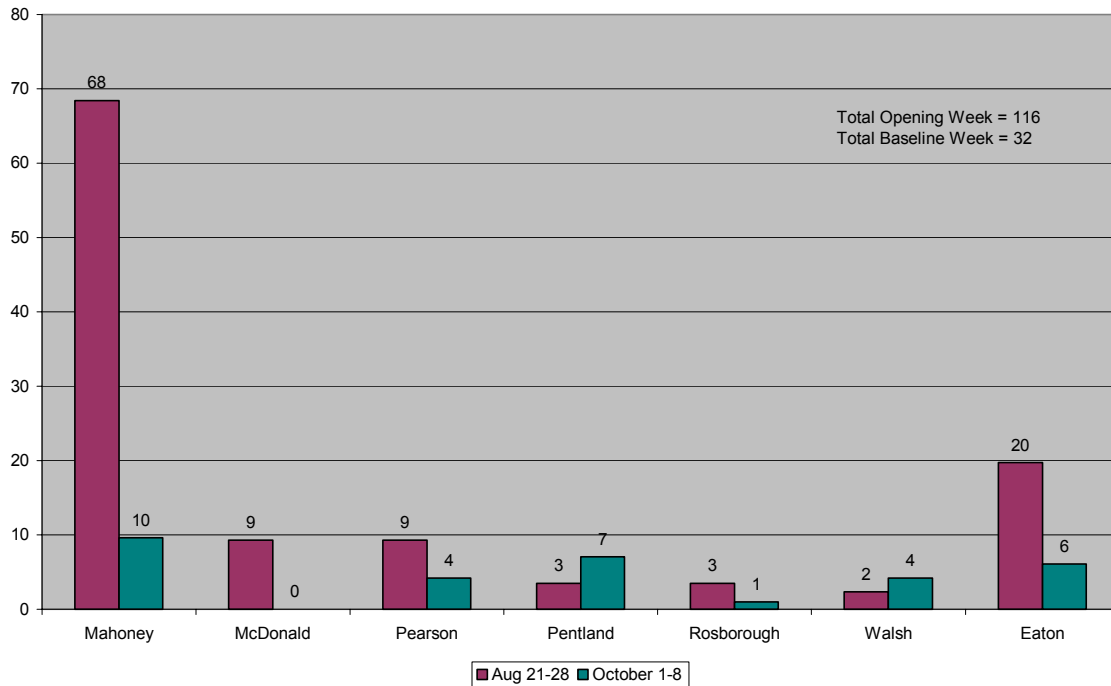


Upon closer analysis of the data regarding the types of HVAC problems, a/c leaks had the most calls. Johnny Williams, facilities manager for Housing Maintenance, advises that many A/C leak calls were condensate leaks. A condensate leak primarily occurs because of poor/aging insulation.

Upon further examination of the a/c leak situation, our data illustrates Mahoney and Eaton Residential colleges were responsible for the majority of the work orders during opening week with 68. Eaton followed with 20 work orders.

The other buildings had minimal work orders due to A/C leaks. Compared with a normal, “steady-state” week (October 1-7), we see that there are 262% more leak work orders during opening week.

**A/C Leak Work Orders - Opening Week and Normal Week 2004**

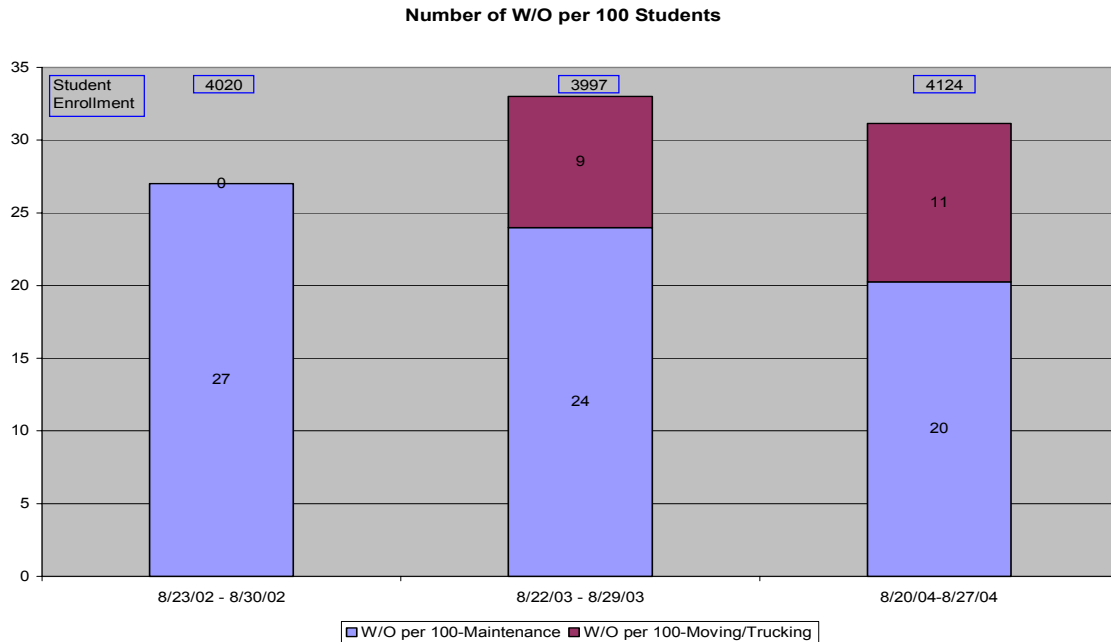


We have identified several potential maintenance project alternatives to be explored that will address this situation. As we are developing more data for this issue, Residence Halls wishes to analyze the final annualized data before determining which path to take.

The overall volume of calls increased 21% (39 w/o) from Summer 2003. In addition, this represents an increase in the volume of electrical calls of 8% (18 w/o) from Summer 2001, our benchmark year. We are currently able to gather information for areas we previously had not captured specific data. This is partially attributable to the recent upgrade to our work order management system.

Our data has also indicated that student enrollment in residential facilities has generally increased from Summer 1999 (3417) through Summer 2004 (4124).

Given this fact, we utilized these figures to determine the number of work orders requested per student, normalized per 100 students, for the eight-day period of opening. We found that the number of work orders requested per 100 students during the eight-day period of opening in Summer Opening 2002 (27) increased 14.6% (4 w/o per 100 students) when compared to Summer Opening 2004 (31).



You may also notice an increasing volume of Moving/Trucking work. We are able to capture a greater detail regarding the types of requests for service, allowing us to focus on specific areas for analysis. Again, this is partially attributable to our recently upgraded work order management system.

It is important to note a paradigm shift that occurred prior to the Summer 2002 exercise. As discussed previously, the Department of Residence Halls is the financial stakeholder in this enterprise. They helped the group to define a different maintenance standard and processes to address specific, targeted maintenance components to be accomplished, as opposed to general, overall maintenance formerly accomplished during the summer housing turnover exercise. There was an expectation there would be a greater call volume, but the re-designed process has also realized significant cost savings.

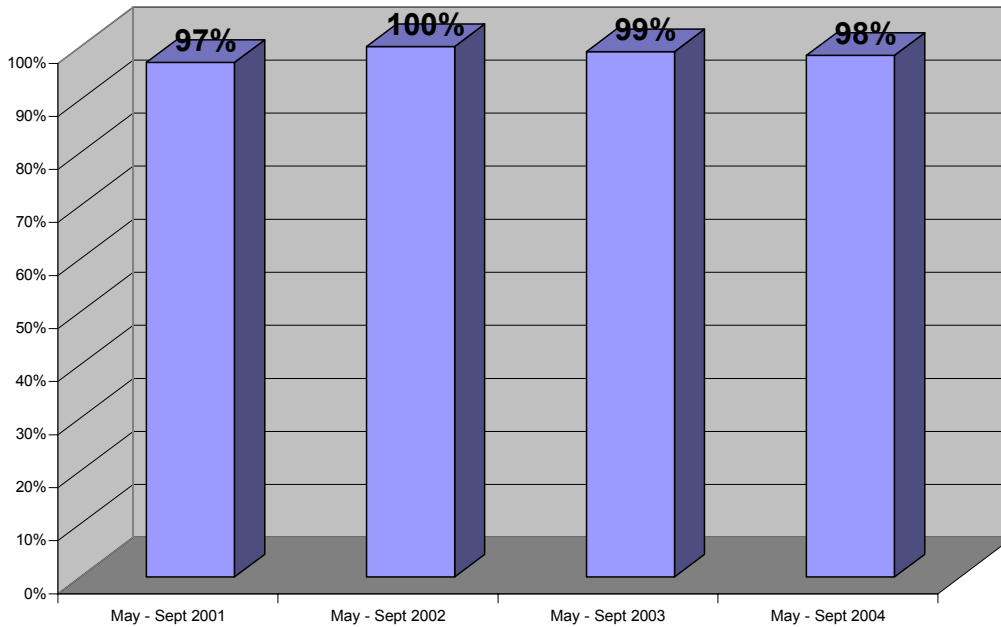
In a further attempt to understand the success of our process, both Physical Plant and UNICCO have been measuring student satisfaction levels regarding maintenance concerns and room/building cleanliness.

There is also data gathered that encompasses the satisfaction level of the building occupants during the accomplishment of the turnover process, summer conferences, summer school, returning student move-in, and a period of time after move-in during which time the students and building occupants “settle” into the facilities.

Physical Plant hangtag polls the requestor of service in four areas:

1. Timeliness
2. Courteousness
3. Cleanliness
4. Overall Satisfaction

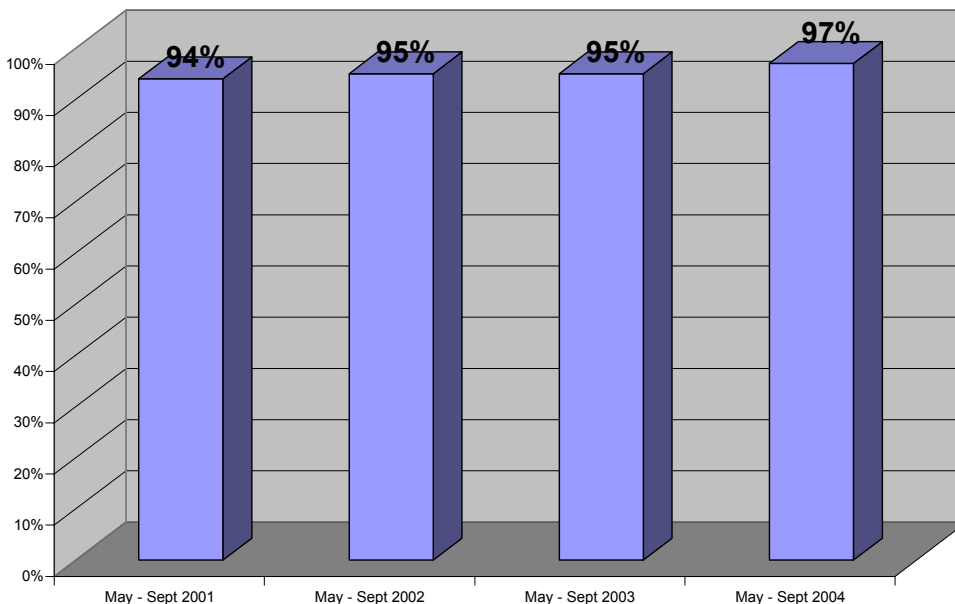
Physical Plant Student Housing Survey Great/Good % May-Sept 2001-04



For the period of May-September 2004, Physical Plant recorded a 98% “Great/Good” satisfaction rating based upon response from comment cards. This represents a decrease of 1% in the rate of satisfaction from May-September 2003. This also represents an increase of 1% for May-September 2001, our benchmark period.

UNICCO also conducted a survey of students to measure satisfaction with room and facility cleanliness. Their poll was also specific to the eight-day period of opening. The survey consisted of a single question, “How do you rate the overall cleanliness of your room?”

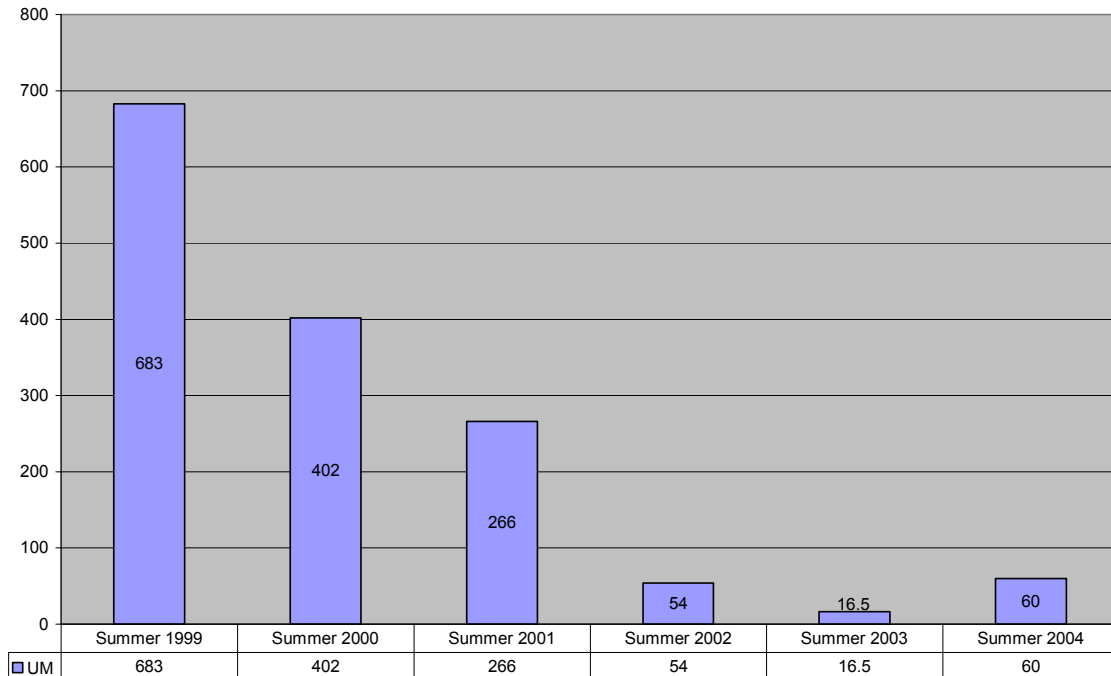
UNICCO Student Housing Survey Great/Good % 8-Day Opening 2001-04



During Summer Opening 2003, UNICCO recorded a 97% “Excellent/Very Good/Good” satisfaction rating. This represents an increase of 2% from Summer Opening 2003. This also represents an increase of 3% from Summer 2001, their benchmark year.

Another area of team focus was budgetary considerations. We have history illustrating how our housing turnover process was able to significantly impact Physical Plant housing overtime for the summer CI process.

**Housing Overtime Comparison (1999-2004)**



In our Summer CI exercise in Summer 2004, we utilized 60 hours of overtime. This represents an increase of 264% (43.5 hrs) in Physical Plant housing overtime from Summer 2003. Although this seems high at first, the increase is well within a reasonable range when compared to overtime in 2001 and previous. It should also be noted that student move-in occurred one week earlier than for Summer 2003; this may have also been a contributing factor.

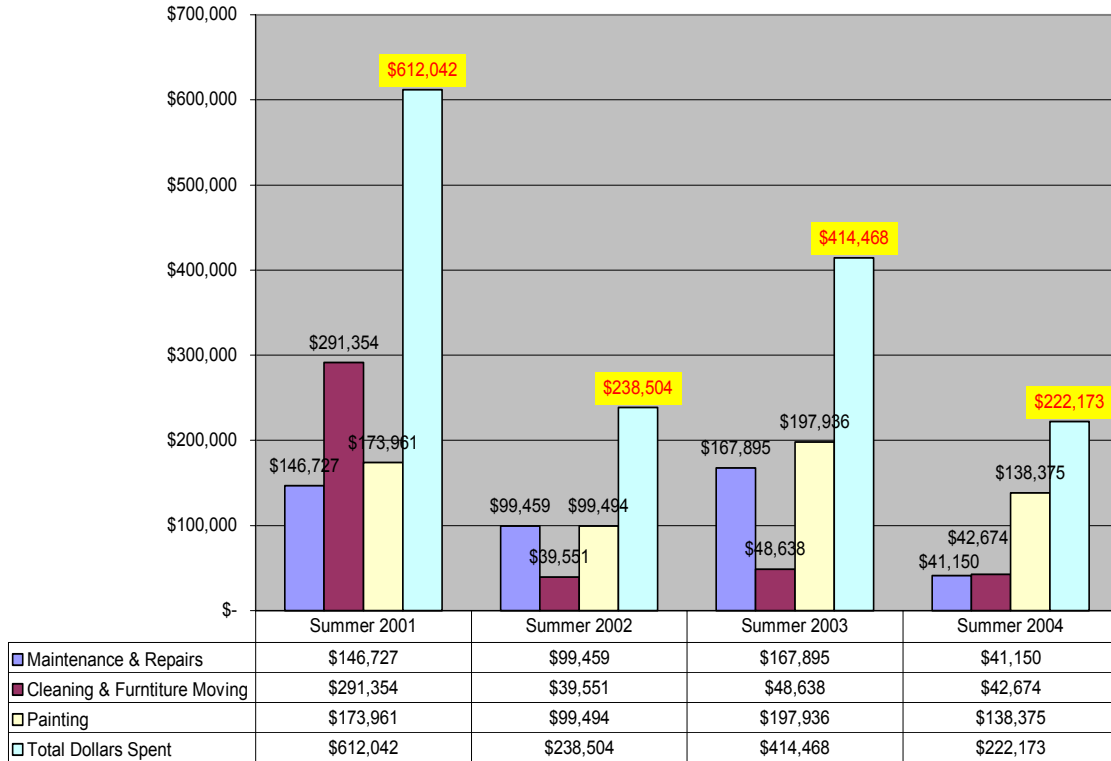
This also represents a decrease of 90.8% (620.2 hrs) in Physical Plant housing overtime from Summer 1999, our benchmark year. Overtime process has been improved dramatically since Summer 2001 and remains stable with acceptable fluctuations.

Our revised housing turnover process was also able to impact the overall actual cost of the turnover exercise. One of the next steps from the 2001 process was to identify major cost centers and address them. The final numbers from last year determined there were three major areas of expenditure:

- Painting
- Cleaning and Furniture Moving
- Maintenance and Repairs

Our overall actual cost for the Summer 2004 Housing Turnover exercise was \$225,173. The overall actual cost for the Summer 2003 Housing Turnover Exercise was \$414,468. This represents a decrease of 45.7% (\$189,295). Additionally, this represents a decrease of 63.7% (\$389,869) from Summer 2001, our benchmark year in this area.

Labor Report Summary (Summer 2001-04)



Our maintenance and repairs cost for the Summer 2004 Housing Turnover exercise was \$41,150. Our maintenance and repairs cost for the Summer 2003 exercise was \$167,896, a decrease of 75.5% (\$126,745). This also represents a decrease of 72% (\$105,577) from Summer 2001, our benchmark year in this area.

There are some costs in the maintenance arena that is highly dependent upon the condition in which the room is left. Therefore, slight fluctuations can occur that are independent of how we manage the CI process. However, in an effort to mitigate this factor, Johnny Williams also advises that many smaller projects were accomplished during the academic year prior to the Housing Summer project that worked to minimize the amount of maintenance that needed to be accomplished during the summer turnover exercise. These projects included:

- Replacement of towel bars. As the original towel bars were easily knocked off the wall or door, these towel bars were replaced with a stronger, more securely mounted fixture.
- Replacement of faucet fixtures with better-quality fixtures to minimize potential faucet leaks.

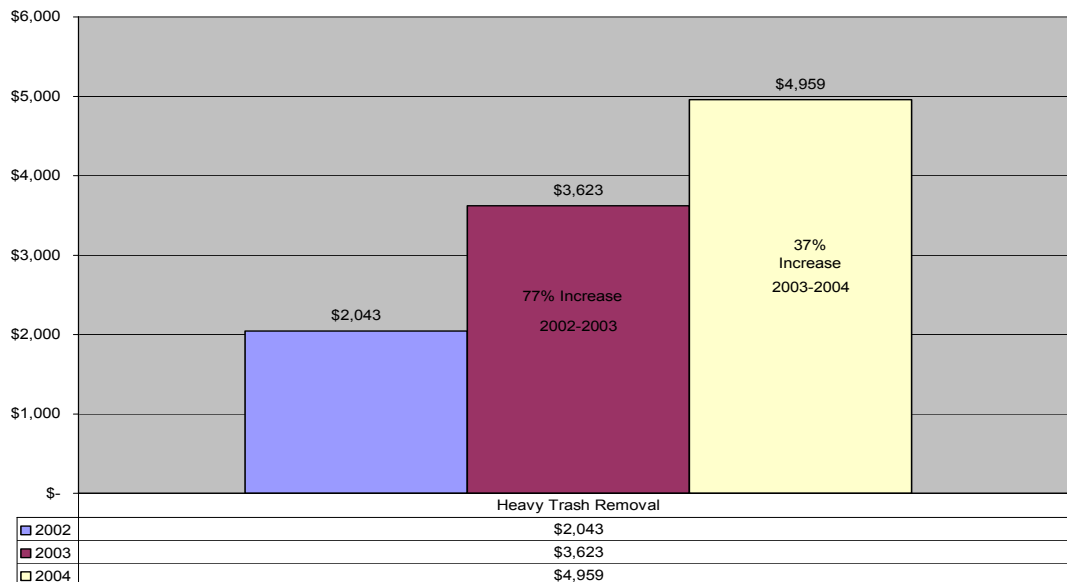
- Replacement of shower heads. In the shower areas for the community restrooms, students would often break off the shower head arms as they sought to adjust the shower head direction. We replaced these heads with a wall-mounted head that using a directional device to adjust shower direction, minimizing the need to twist the shower head itself. These are also water-saver devices.
- Replacement of sinks for common/private student restrooms. Some sinks, and the mounting bracket for the sinks, were aged and corroded. We replaced these fixtures with updated, better quality material.
- Replacement of ceiling tiles. This is an ongoing project to replace all of the ceiling tiles within student residential facilities.
- Replacement of lighting for student rooms with energy-saving, longer-life fixtures and bulbs.
- Also, when a zone mechanic is dispatched for a specific request for service, the zone person will inspect the room for additional maintenance repair items, and coordinate the response from the appropriate trade.

Our cleaning and furniture moving cost for Summer 2004 Housing Turnover exercise was \$42,674. Our cleaning and furniture moving cost for the Summer 2003 exercise was \$48,638, a decrease of 12.3% (\$5,964). This also represents a decrease of 85.4% (\$248,680) from Summer 2001, our benchmark year in this area.

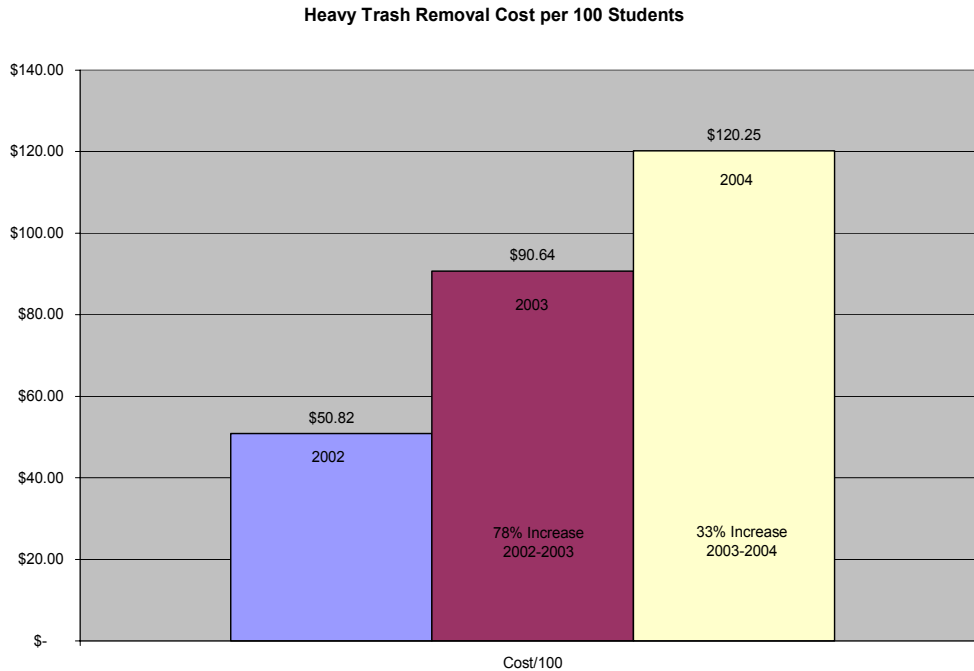
Our painting costs for Summer 2004 Housing Turnover exercise was \$141,375. Our painting costs for the Summer 2003 exercise was \$197,936, a decrease of 28.6% (\$56,561). This also represents a decrease of 20.5% (\$35,586) from Summer 2001, our benchmark year in this area.

Closer examination of the data indicates a specific area of increase that bears closer analysis. These areas illustrated are those areas that realized an increase of 25% or greater from Summer 2003:

**Areas of Focus - Heavy Trash Removal**



We noticed an upward spiral regarding the percentage of increase in the amount of heavy trash removal. There is a possibility that the volume of lofts built by students is increasing which is causing an increase in the cost to remove them. Following is a chart illustrating the cost of heavy trash removal per 100 students.



Along with an increase in total amount spent on heavy trash removal, the cost per 100 students increased 33% from 2003. Facilities will further look into the costs associated with these lofts in the next year.

Although the dollars involved are somewhat negligible, the team did notice a potential correlation between the costs increase and percentage of increase for the heavy trash removal and the non-CI related calls for moving and trucking. When querying UNICCO regarding any link, they confirmed there has been an increase in the amount of lofts that needed removal at the beginning of our CI cycle. They also indicated there were numerous requests for furniture removal so students could build lofts in their rooms.

The need to potentially manage this issue has an interest for the team from a maintenance standpoint, as the rooms suffer damage from the construction, use of, and disassembly of these loft units. There is also a concern regarding the build quality of these units. The group has come up with several ideas to be addressed in our Next Steps.

Student satisfaction with the summer turnover effort is high, although the work orders per student for the eight-day cycle of move-in continue has increased. We may not have direct control over some of these factors.

Worker satisfaction has improved. The coordination of the accomplishment of tasks has greatly reduced the congestion and confusion of former turnover events, and minimized rework in this area.

### Next Steps:

Our expectations for the next cycle will consist of continued analysis and refinement of the process, including:

- Continuing to establish budgets for each functional area, and assign budget ownership for each component.
- Review the summer turnover process and continue to think beyond current paradigms.
- Refine the hang tag used by the inspectors.
- Continued use of a Gantt Chart to schedule the various components of jobs to be accomplished, and to establish a baseline budget.
- In-depth analysis of painting needs and contractor coordination.
- UNICCO to continue their satisfaction graph.
- Improve on inspection process with new forms and/or formatting.
- Manage the CI process with fewer meetings by continued use and development of tools to assist (Gantt charts, financial reports, etc.)
- Undertake a survey of students to determine demand for lofts and an approximate number for the amount of lofts per dorm.
- Explore the feasibility of developing a University standard for a loft; outsourcing it development and construction. These lofts could be permanent fixtures of a room.
  - Also to be explored would be the use of “modular furniture” for student rooms. These would be configurable for the student.
- Explore the feasibility of designating specific floors for lofted rooms. (Charging more for these units)
- Explore the feasibility in the elimination of lofts entirely.
  - Consult lawyers to establish liability in providing lofted rooms.

The Department of Residence Halls has realized a sincere desire to achieve dramatic improvement, rather than accomplishing small “incremental” gains. The team will continue to research new and improved methods for accomplishing the turnover process with this perspective.