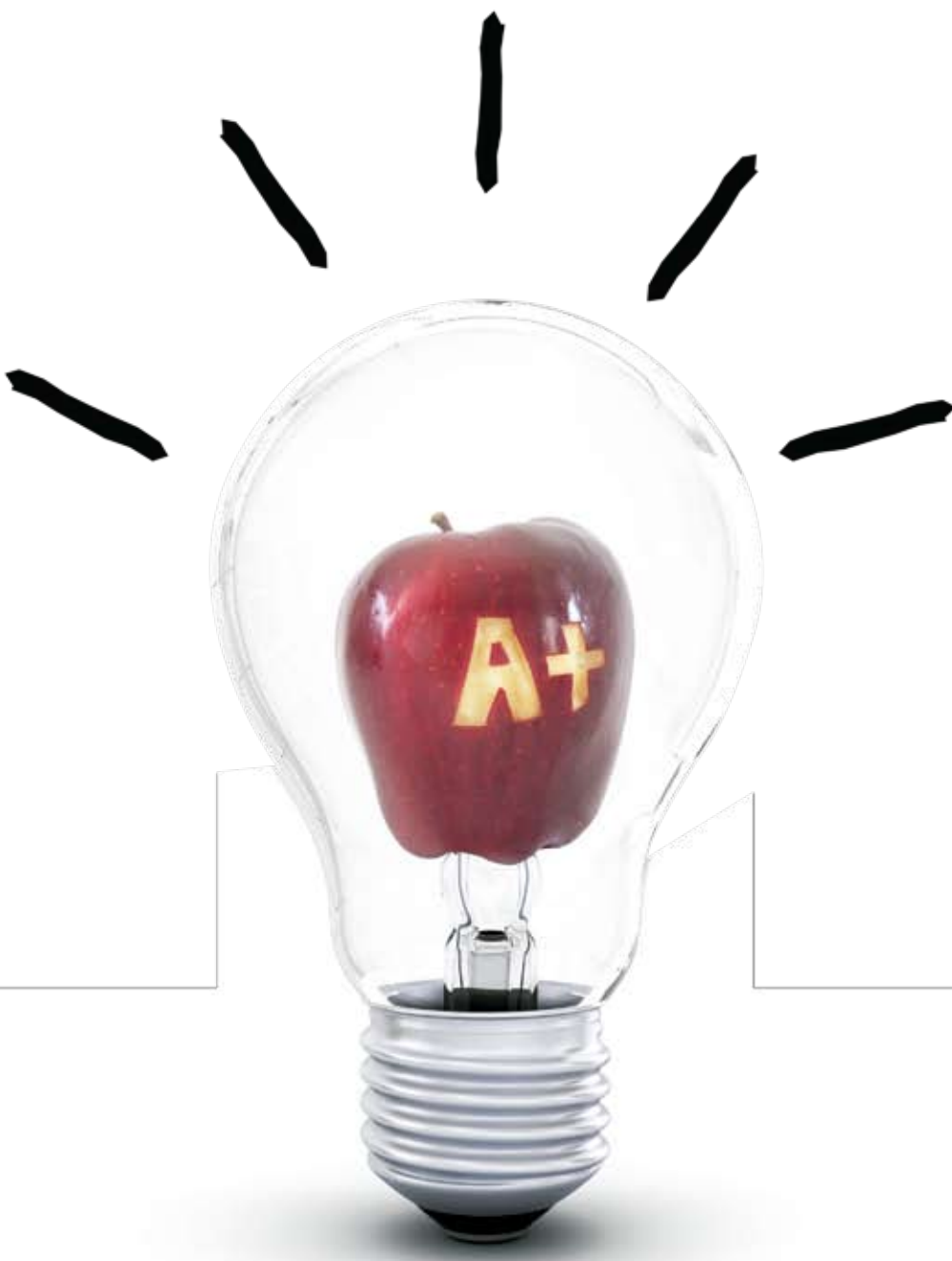


Creativity Marks

the 2009

Effective & Innovative Practices

Award Winners



APPA's Effective & Innovative Practices Award continues to highlight an ever-growing list of creative and practical programs and processes that enhance and transform service delivery, lower costs, increase productivity, improve customer service, generate revenue, or otherwise benefit an educational institution. The five 2009 award-winning entries focus on small renovation projects; employee recognition; utilities distribution systems; safety training; and capital asset documentation.

Up to five Effective & Innovative Practices Award submissions are eligible each year for a cash award of \$4,000, which is generously sponsored by Sodexo Campus Services. Entries are judged by APPA's Professional Affairs Committee and are based on 1) institutional benefit; 2) innovation and creativity; 3) portability and sustainability; 4) management commitment and employee involvement; and 5) documentation, analysis, customer input, and benchmarking.

The five successful schools received special recognition and a check at the APPA 2009: Focusing on the Critical Few conference in Vancouver in July. The awards were presented by Craig Bell of Sodexo and APPA's Bill Elvey and Kevin Folsom.

To view the complete applications and summaries from previous award winners, or to learn how to submit an entry for the 2010 awards, please visit www.appa.org/recognition/effectiveandinnovativepractices.cfm.

University of North Texas

REVISED SMALL RENOVATION DELIVERY PROCESS

BY CHARLES A. JACKSON

Charlie Jackson is executive director of facilities at the University of North Texas, Denton, TX; he can be reached at charles.jackson@unt.edu. This is his first article for Facilities Manager.

The University of North Texas Facilities Department revised the small renovation project delivery process in response to widespread customer and employee dissatisfaction. After a “peer review” of the many different methods used by other institutions for project delivery, the revelation came to us that *if we wanted to be compared to a contractor, we needed to act as if we were a contractor.*

We then created a new project delivery methodology with guaranteed “contract pricing” prepared from RS Means’ average pricing. Estimates using average pricing could usually be completed from the plans without time-consuming site surveys.

The result has been consistent pricing for similar remodels whether constructed by in-house personnel or outsourced construction firms. The guaranteed pricing has been especially well received by the customers. This method of delivery provides productivity incentives for the in-house construction team to work efficiently as if they were a small contractor.

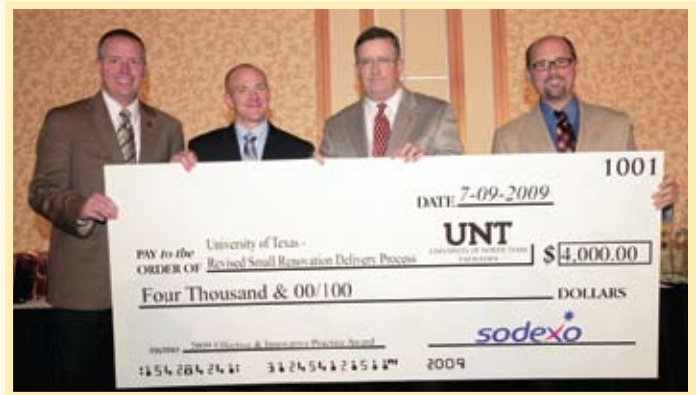
INNOVATION/ CREATIVITY/ ORIGINALITY

Small renovation projects were usually in trouble from the very start, as there was never sufficient time to prepare a detailed estimate. In an attempt to expedite the estimating process, contractors would be brought in. Their subsequent initial estimate generally exceeded the budget, and this would then precipitate scope reductions or cost overruns.

In addition to the estimating challenges, projects previously were billed to the customer through a combination of work orders and purchase orders. Final billing could not be completed until the last work order was closed and the final vendor invoice had been paid. This resulted in a stream of charges that aggravated the customer’s financial staff as well as the Facilities Business Office.

Everyone was dissatisfied with the process. As a result, three major changes were made to the procedure:

1. Estimates are prepared using average unit pricing.
2. These estimates are then guaranteed and invoiced as a “fixed price.”
3. Finally, billing was changed so that the customer is only



billed twice; 50 percent when the notice-to-proceed is issued and 50 percent upon occupancy.

This procedural change meant that Facilities was operating with the same set of “best practices” used in businesses. Funds are collected in a revolving account.

INSTITUTIONAL BENEFITS

The value of consistent estimates is obvious. Customers with similar remodels were now paying the same charges whether the project was completed in-house, by contract, or by a mix of the two. Customers were thrilled to know that they were able to receive their project for an agreed upon price that would change only if they requested additional services.

Costs incurred throughout the project were collected and reimbursed to the project fund account only after the client was satisfied. The final billing included any authorized changes to the scope and the administrative charges. By reducing the number of charges impacting client accounts and working from a signed and approved project budget, reconciliation of expenditures was improved, client expectations were better managed, and budgetary accounting was simplified.

Lastly, the benefits recognized by Facilities operating as a business enterprise cannot be overstated. Customers are impressed when estimates are calculated with a fixed price per square foot or square yard and then guaranteed. Our staff feels as if they were competing against a standard. The bar of professionalism is raised.

PORTABILITY AND SUSTAINABILITY

In our survey, we found that small project delivery procedures varied widely. Some schools charged materials but not time. Some institutions included overhead in their time calculations while others did not. Still, everyone was burdened by final cost not matching the estimate for all the same reasons. Estimating using an average cost and then guaranteeing the estimate would solve this problem no matter what methodology is used for developing the hourly rates at the institution.

UNT
UNIVERSITY OF NORTH TEXAS
FACILITIES

The only ingredient necessary is management commitment to the process, because while Means or average estimating provides a good starting point, developing accurate average rates means that some projects come in slightly over budget and thus “lose” while others make money. It takes a several month commitment to demonstrate that this will work out.

The reality is that in our experience that the University of North Texas never “lost” money but only made less recovery on some projects than we did on others.

MANAGEMENT COMMITMENT AND EMPLOYEE INVOLVEMENT

When average pricing is used, everyone involved needs to remember that “average” is just that. If \$2.65 per square foot is used as the price for new ceiling construction, then it should be remembered that this average will work out over the course of a year; panic on the first job where the ceiling costs \$3.00 per square foot because of an unforeseen problem will cause the program to fail. In that respect, the University of North Texas administration allowed this initiative to succeed by supporting it long enough for all involved to have confidence in the plan.

The construction employees grew to appreciate the new process because they now had a benchmark and standards. The estimators were glad to be relieved of the perceived pressure to foresee every contingency. The Budget Office and the Facilities Business Office enjoyed the simplicity.

PROGRAM ANALYSIS AND DOCUMENTATION

This program will be successful when the average unit costs are realistic, as this approach provides value for the customer and incentives for the Facilities organization. Indeed, either excess revenues or unrecovered costs will lead to “business” or program failure, just as it would with the contractor.

The University of North Texas successfully used this methodology to “fast track” 45 remodel and renovation projects with an estimated value of \$6 million prior to the start of classes in the fall of 2008. The final costs on nearly all of these projects were very close to the original estimate.

There will be administrative problems with this model if it cannot be demonstrated conclusively that in the long run the construction and remodel operations are “nonprofit” and at “zero sum.” State facilities organizations cannot legally subsidize auxiliary operations nor will Office of Management and Budget A21 guidelines tolerate excess revenues. A long-term balance sheet needs to be created and the unit costs need to be monitored and readjusted as required.

This new practice accelerates service delivery, lowers costs, increases productivity, improves customer service, and generates revenue.



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University of Texas at Austin

EMPLOYEE RECOGNITION SITES AWARD

BY LAURIE D. LENTZ

Laurie Lentz is communications coordinator for facilities services at the University of Texas at Austin; e-mail her at laurie.lentz@austin.utexas.edu. This is her first article for Facilities Manager.

While educational institutions face challenging financial times, one initiative that can improve morale and help employee retention without incurring big expenses is an employee recognition program.

The University of Texas at Austin (UT) is one of the largest public universities, with approximately 50,000 students and 21,000 faculty and staff. Facilities Services maintains 18.6 million gross square feet and supports 439 buildings encompassing 901 acres of campus grounds in the heart of Austin, Texas. Working with our sister department, Project Management and Construction Services (PMCS), we support our campus community with a combined workforce of 1,039 employees.

One of our strategic goals is to have a highly motivated, well-trained, stable workforce. To achieve this, we have implemented two employee recognition programs:

Employee Recognition SITES award and **“On-the-Spot” Award**. Both are endorsed by university management and are highly regarded honors throughout the departments.

EMPLOYEE RECOGNITION SITES AWARD

The SITES award identifies employees who demonstrate exemplary performance above and beyond regular job functions, exhibiting the core values of Facilities Services and PMCS: **Service, Integrity, Teamwork, Excellence, and Stewardship**. These are the award criteria:

- **Service** - consistently focuses on unconditional efforts to best serve our customers
- **Integrity** - consistently earns the trust of others through professional conduct that includes honesty, reliability, and competency
- **Teamwork** - consistently works together cooperatively in support of our mission. We value each individual and their contributions to the team and treat each other with respect and dignity
- **Excellence** - consistently and enthusiastically delivers quality services to our customers while consistently seeking to improve those services through creativity and innovation
- **Stewardship** - consistently conducts business in an environ-



mentally, socially, and economically responsible manner that is reflective and protective of the public trust placed in us as stewards of the university's facility-related resources

SITES has gained momentum since its 2006 beginning. We've received 204 nominations, representing 19.6 percent of the Facilities Services and PMCS workforce. Thirty employees have received this award.

THE UNIVERSITY OF TEXAS AT AUSTIN
WHAT STARTS HERE CHANGES THE WORLD

How an employee is nominated

The nominator completes the Employee Recognition Nomination Form available online or in print and sub-

mits the nomination to the Employee Recognition Committee chairperson or Facilities Services/PMCS Director's Office.

Who can be nominated?

Nominees must be employed by one of the departments for at least one year before being nominated. The award is not open to directors, associate/assistant directors, previous year recipients, groups, crews, or current members of the Employee Recognition Committee.

Helping employees nominate peers

To address concerns that only those who could write well would be able to nominate a winner, working sessions were set up in 2008 to help employees put their thoughts into words on the nomination form. The number of applications submitted surged, up 79 percent from the previous year.

During the nomination month, employees are told about the program through e-mails, staff meetings, and informational posters.

How winners are selected

The Employee Recognition Committee is made up of the past year's recipients, as well as delegates from the directors' offices of Facilities Services and PMCS. This committee

1. Reviews all nomination forms
2. Creates a selection matrix
3. Forwards names of finalist(s) (no more than ten) to the assistant director of Administrative and Personnel Services and the directors of Facilities Services and PMCS, who ensure that the nominee is eligible and the documented service or activity reflects exemplary performance for recognition.

What's awarded?

- Recognition activity with shop or office employees
- Certificate of recognition
- \$500
- 8 hours paid time off
- Recognition group photo plaque, on public display in main lobby
- Recognition on the PMCS and Facilities Services websites
- Personal gift
- SITES award pin

ON-THE-SPOT RECOGNITION PROGRAM

Facilities Services and PMCS employees can be honored for their exceptional workplace efforts "on the spot" by their supervi-

sor, manager, or director with an "On-the-Spot" card. Recipients claim one of five gifts and receive eight hours of leave with pay.

Giving and redeeming the award

1. The supervisor, manager, or director notes the employee's exemplary action on the card, signs it, and gives it to the employee.
2. The employee selects one of five recognition items listed on the tear-off section of the card. He or she takes that section to Central Stores (our distribution center for parts and supplies) to obtain the selected item.
3. Central Stores retains the tear-off section for tracking purposes. Employees are encouraged to send a copy of the remainder of the card to Personnel for their employee file.

What's awarded?

Employees have a choice of

- Dominos
- Flash drive
- UT folding chair
- Leatherman multi-tool
- Cooler



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INSTITUTIONAL BENEFIT FOR RECOGNITION PROGRAMS

SITES heralds a group of hardworking employees selected based on input from peers. Of the 30 SITES winners, only one employee no longer works for the university.

PORTABILITY

These recognition programs could be easily adopted by other institutions. Procedures are adaptable, and we willingly share lessons learned along the way.

MANAGEMENT COMMITMENT AND EMPLOYEE INVOLVEMENT

The vice president of university operations endorses both recognition programs. Winners are applauded for their efforts to make UT a first-class institution.

DOCUMENTATION, ANALYSIS, CUSTOMER INPUT, AND BENCHMARKING

- **SITES:** A copy of the award letter or certificate is filed in each nominee's personnel file. The directors of Facilities Services and PMCS send a congratulation letter to nominees.

An e-mail listing the winners is sent to employees of Facilities Services and PMCS.

A standard operating procedure ensures consistency year to year. At the conclusion of each year's awards, the selection committee meets to discuss lessons learned.

SITES was modeled after the University Operations SLICE award (Service, Leadership, Innovation, Creativity, and Excellence), which is our benchmark.

- **On-the-Spot Program:** The "On-the-Spot" card is tracked through Central Stores, where the employee redeems his or her prize. The employee can have a copy of the card included in his or her personnel file.

We plan to benchmark other educational institutions to see what recognition programs they have developed and explore any lessons learned.

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Valparaiso University

NATURAL GAS & MEDIUM VOLTAGE DISTRIBUTION SYSTEM

BY FREDERICK W. PLANT

Fred Plant is executive director of physical plant at Valparaiso University, Valparaiso, IN; e-mail him at fred.plant@valpo.edu.

This project involved the negotiation of a contract with our local utility company that caused that company to replace the university's substation, natural gas and medium voltage (12,500) distribution systems throughout the campus.

INSTITUTIONAL BENEFIT

The benefits to the utility company were an increased revenue base because the rates moved to the utility's regulated rate structure. Secondly, during the 36 months of financial recovery the university agreed to purchase commodities from the utility company. The utility company was granted a site for the substation on the university



VALPARAISO
UNIVERSITY

property, which saved the utility company a prolonged acquisition process. This substation serves not only the university but other customers in this area of the city.

A principal benefit to the university was avoiding the backlog of deferred maintenance related to these two systems. This project also transferred the maintenance of these two systems to the utility company for the university. Every building is metered for natural gas and electric with the university having access to these electronic meters for

our own data collection. By separately metering each building the university no longer spends time attempting to manage power factor correction nor demand since most of our buildings are small enough not to consume power at these levels.

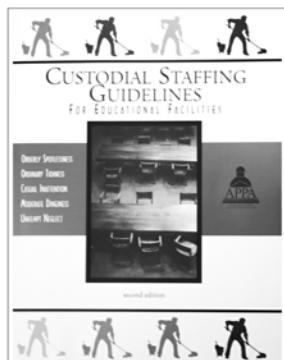
The first byproduct is the ability to reallocate our labor and maintenance budget. Additionally this eliminated many of our confined space issues because the electric manholes were all eliminated. The university no longer pays for electric line losses from the substation to the campus buildings. The internal accounting for these two utilities is greatly simplified because the buildings are individually metered.

The design of the system also created two feeds to the campus from opposite directions and substations, providing redundancy.

INNOVATIVE, CREATIVE, AND ORIGINAL

The university's leadership, including its Board of Directors, were supportive of this project. In their view a large deferred maintenance obligation was eliminated; there was a great increase in the capacity of these two systems; and the operating budget in

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terms of maintenance and labor were able to be reallocated to offset other budget pressures.

The process of working through the contract documents, easements, real estate lease for the substation, rights of way took many months. This include leadership and legal counsel from the utility, university, and city were all involved in organizing the paths necessary to allow this to occur.

Our Facilities Management Department staff was involved during the one-year planning process, which involved data collection, logistics planning, and the development of paths and sequences. The construction process was confined to six months, which required our staff to mark old lines in advance of construction, coordinate outages/startups, minimize startup loads, verify when equipment came back online, light pilots, make sure meters were sending pulse, clean natural gas filters until lines were purged, and then organize the site restoration.

SOME OF THE OUTCOMES

- 2001 Total Purchase Energy was 171,338 MMBTU....by 2007 it was 163,777 MMBTU even though over 100,000 s.f. had been added

- 2001 Total Fossil Fuel purchased was 118,001 MMBTU...by 2007 it was 114,984 MMBTU
- 2001 Total Electric purchased was 53,337 MMBTU...by 2007 it was 48,793 MMBTU

As the natural gas and electrical system project was underway, plans for a second phase were developed. This second phase began within a few weeks of the completion of the natural gas and electrical system project.

This increased the natural gas and electric capacity to levels that would allow the campus to increase its square footage, which has occurred by approximately 12 percent. In addition to this project the university also replaced its domestic water distribution system and constructed a voice/data ductbank.

Having this increased natural capacity provided the opportunity to install high efficiency boilers in buildings served by a central boiler house. This allowed this central boiler house, functioning at 80 percent efficiency, to be retired. This resulted in retiring the high temperature hot water system as well. The university budget was advantaged by a decrease in energy loss from the distribution system, elimination of associated water softening, water treatment chemicals, assorted pumps and motors, and a good deal of labor.

Weber State University

SAFETY TRAINING BOARD GAME

BY SHAWNA ROWLEY

Shawna Rowley is finance and human resources manager for Weber State University, Ogden, UT. She can be reached at srowley@weber.edu. This is her first article for Facilities Manager.

Every institution requires its employees to attend safety training. No one would argue that it is necessary, important, and beneficial. But when employees are told that it's their turn to attend, more often than not, the reaction is accompanied by a groan. Most of our employees told us that safety training was boring, that it was hard to sit and listen to someone lecture on one topic for hours at a time. This is especially true considering the fact that most facilities employees are used to being out and about and on their feet and not sitting in an office.

Based on feedback we received on previous training sessions, we set a goal to develop an approach to safety training that would be both educational and fun. We wanted to create something that would have our employees asking when it was their chance to go to safety training, rather than dreading their turn.



To accomplish this goal, we developed a training approach based on a popular board game. Participants would be placed into four groups and the groups would compete against each other. We had hoped that the competition factor would increase participation. Our expectations were exceeded beyond belief. The training was wildly successful!

HIGHLIGHTS

The game board was personalized to our institution and reflected our campus in a positive light. It gave the participants something they could easily relate to and identify with. Our mascot served as the starting point and our most recognizable landmark (the bell tower) served as the finishing point. The spaces on the game board

were in our school colors: purple and white. Although we used the board during safety training, the nice thing about it is its flexibility. The game board can be adapted and used during any type of training session.

All participants were exposed to a wide variety of safety topics. These topics ranged from lockout/tagout to properly storing cleaning chemicals. It was designed to give all employees a broad overview of the important safety topics facing the facilities industry as a whole.

Our workers compensation insurance representative attended all of our sessions and spoke for about 15 minutes on the topic of reducing workers compensation claims. He also took questions from the audience. This allowed us to have an expert present at the meeting but limited the amount of lecture time. Then, we spent about an hour playing the interactive game.

The rules of the game were simple. Participants were divided into four groups and each group elected a spokesperson. During their turn, each group was given a randomly chosen question. As a group, they could discuss the question among themselves and come up with an answer. The spokesperson would then shout out the answer. If they were right, their game piece would be moved the corresponding number of points. If they were wrong, another team could try and steal the points. This required that

all teams pay attention to all questions (and as a result, be exposed to all the question topics). When it was all said and done, what the winning team won was bragging rights. Everyone who played received a first aid kit as a prize. We were all winners because we were all learning.

HOW OTHERS CAN ADAPT THIS IDEA

This concept is an easy one to adapt for any business. We happened to have access to an artist who could draw our game board but one could also use an aerial photo, a map, or clip art. And if someone were to take the time to create a personalized game board like we did, then it's nice to know that the game board can be used for an endless number of situations. Institutions of higher education are fortunate because we generally have access to many art students who would welcome the opportunity to make a little bit of money drawing cartoons. It's inexpensive to create, yet makes an amazing impact. Every time we revealed the game board, people made comments about how cool it was and many asked if they could have a copy of it.

The game can be used with any number of people. We've used it with groups as small as 12 and as large as 85. No matter the size of the group, we just took the total number of people and divided them into four teams.

Other similar ideas include using a poster of a race track or road and "racing" Hot Wheels cars around it. Or, you could get a picture of a football field and move people in one-yard increments. Really, the possibilities are only limited by one's imagination. We love the idea of someone looking at our game board representing Weber State and then coming up with their own way of adapting the idea to their location. The possibilities are really endless.

COMMENTS

Kevin Hansen (Associate Vice President for Facilities and Campus Planning):

"Safety training is necessary, valuable, and most often boring. The dry lecture or outdated safety film that numbs the mind and does not stimulate interaction or thinking on the part of the trainee is the norm. Such is not the case at Weber State University. Shawna Rowley found a way to make safety training fun, interactive, competitive, and collaborative. Her safety game got people talking, laughing, thinking, and collaborating in a fun, non-threatening competitive environment so

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everyone was engaged. The safety questions to be answered covered every craft and circumstance, so all were benefited by every answer, and all who attended came away enlightened. And did I say it was fun! Shawna followed one of the management philosophies we espouse at Weber State Facilities Management, best captured in a quote from General George S. Patton: 'Never tell people how to do things, tell them what to do and they will surprise you with their ingenuity.' As the executive over Facilities Management, Shawna captured everything I am encouraging in every employee. She then took it to a much higher level."

EMPLOYEE COMMENTS

Employees were generally receptive of the idea for this training. We've hosted three of these safety-related training sessions so far. We have approximately 250 employees in Facilities Management at Weber State and about 180 of them attended one of those three sessions. Since the last session, I've had countless people ask me when I'm going to schedule another session. People who weren't able to attend one of those sessions have heard others talking about it and are wondering when they'll get a chance to play!

As I stood by the door during each session, handing out first aid kits and thanking people for attending, I heard many

positive comments from the participants. One person even left a voice message for me during the time it took me to get from the training session to my office. He said he enjoyed the "very, very good" meeting and just wanted to thank me for hosting it. Other comments I received are listed below:

"I have to be honest; I went to the meeting last Friday with a bad attitude – all the usual stuff about more things to do than time to do them. The meeting proved worthwhile, however, and I appreciate your efforts in putting it together and carrying it off (and for turning my attitude around.)"

"I thought the game was fun, it was a good way to cover lots of safety rules that we tend to just take for granted, and may even forget. All of us need to be reminded on a regular basis."

"I learned some new things and I'll admit that's rare for me."

"Everyone in my area reported that it was one of the better safety meetings because the speaker was brief and hit on important areas. The game was fun and a good thing instead of one speaker talking for the entire time."

"You guys kept it light and free flowing. I had a good time."

"I liked the training. It was a good and fun reminder."

"The game was a fun way to go over safety rules."

"It's always good to keep safety as a reminder. I liked your class participation game."

Western Michigan University

IN-HOUSE CAPITAL ASSET DOCUMENTATION PROGRAM WITH GIS BY DANIEL LIST

Dan List is the GIS manager, facilities management, for Western Michigan University, Kalamazoo, MI; e-mail him at daniel.list@wmich.edu. This is his first article for Facilities Manager.

The Department of Facilities Management at Western Michigan University is responsible for operating and maintaining the physical environment of the university community. This includes 151 buildings with 8,814,880 sq. ft. of building space, over 1,200 acres of grounds, 23 miles of roadways, 39 miles of walkways, and over 120 miles of utilities.

THE PROBLEM

In the mid 1990s details about the campus utility systems and landscape infrastructure existed primarily on old

faded drawings and in the minds of a few seasoned employees. By engaging students from the Department of Geography and College of Engineering and Applied Sciences to undertake a Geographic Information System (GIS) Initiative, WMU was able to document their infrastructure in a digital map format. It is also important to note that this was done in a time of limited funding and without sacrificing other Facilities Management initiatives.

THE SOLUTION

Initially, GIS and GPS technology were combined to record the position of all utility assets such as vaults, manholes, and shutoff valves. In addition to assisting with requests for utility locations, the location data enabled WMU to significantly reduce the staff time involved in filling location related requests. For instance, in a region accustomed to over 60 inches of snow per season, Landscape Services began using the data to create and continually update their snow removal plan. A tree inventory project was also completed, which established the GPS location of over 5,000 trees along with their species and other physical attributes.





Students were hired based on their technical GIS expertise. Once projects objective were established, the students were responsible for designing, completing, and integrating them. Electing not to hire outside contractors saved the university thousands of dollars upfront, and the project management opportunities offered to students has greatly enhanced their educational experience.

One of the goals of the GIS Initiative was to make the data available to staff and other university users through a user-friendly, interactive Web application. Initially, the upkeep of the site was handled internally by Network Services staff. The website has both a public and a secure access application that can be accessed from www.fm.wmich.edu/gis. With minimal training, staff members are able to use the site to view the location of features and associated information about size, type, and condition. Examples of information linked to this site include videos of the sanitary sewer condition and thermal imaging reports of the steam distribution system. The website is completely customizable and expandable.

In 2008 the decision was made to hire a professional GIS Manager. This was done to provide consistency in supervision, continuity in program goals, and increased technical expertise to expand the program. A new full-time position was created by merging vacancies gained through retirements and attrition at a time when the entire State of Michigan and WMU were battling funding shortfalls. The GIS Manager is responsible for the oversight of GIS data collection, data management and security, and data accessibility. The manager would also be principally responsible for maintaining the GIS website and continuously looking for ways to improve it, thus reducing the load that was put on the limited Network Services staff. Even with a GIS Manager on staff, there continues to be a commitment and focus to involving student staffing.

GIS is used frequently in the "Miss Utility" locator program, of which WMU is a participant. When dig requests are made, a map of the potentially affected utilities is generated by support staff at the Facilities Management Service Center. The appropriate utility manager is then responsible for locating the utility. If the manager finds discrepancies between the map and what is located, then he or she communicates the issue to the GIS staff for correction.

The detailed information gathered by the GIS Initiative will make it possible in the future to go about asset management in an organized and quantifiable fashion. Currently,

WMU is using GIS to assist in researching the replacement costs of existing systems. Also, the expandability of the system enables WMU to gather increasing amounts of data that facilitates future analysis and more informed decisions.

The data has survived several changes in software, hardware, and direction, and has enabled the campus utility managers to identify and track the condition of the utility systems in order to prioritize line repairs and replacements, with the goal of fixing them before they fail.

PROGRAM ANALYSIS

Knowing the precise location of all the aspects of the physical environment has proved to be valuable in planning, executing, and analyzing projects on campus. Given the informal way WMU went about the development of the GIS Initiative, it is difficult to ascertain the program's specific cost to implement. Our best estimates put the cost from \$50,000 to \$60,000 through 2007. Most of this was spent on part-time student wages, staff supervision time, and contracted services. The GIS Initiative used technology and students to transform existing information from a fragile hard-copy state where it was difficult to find key information, into a specifically organized and secure system.

Cooperation between municipal and county government agencies has also greatly enhanced the GIS. In recent years, reliance on data capture has shifted more towards the use of aerial photography rather than GPS due to the availability of high-resolution photography through local partnerships.

The GIS Initiative combines the mission of the university to educate students with the demand on Facilities Management to deliver services. In this, the students themselves have been essential to creating a system that effectively expands their educational achievements and improves the operational success of WMU. ⑤

