MAKE THE MOST OF YOUR PURCHASING POWER

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ABSTRACT

The expansion and maintenance of building systems on educational campuses require huge financial expenditures. Public schools and colleges must make the most of each available dollar. The combination of effective building systems master planning and purchasing standardization program management (PSPM) maximizes purchasing power.

Proper building systems master planning helps owners get what they want from buildings with greater opportunity for success. Master planning yields benefits in budgeting, staffing, equipment, and opportunities for standardization.

PSPM is a strategy utilizing the "buy now-pay later" concept. Equipment is pre-selected and pre-priced for projects as outlined in building systems master plans, and, frequently, in bond programs. Bulk purchasing and standardization, while normally thought of in reference to office and cleaning supplies, can also be applied to big-ticket items. The result is reduced first costs and a domino effect of other savings.

Case studies will be presented from Texas school districts that demonstrate successful building systems master planning and PSPM programs. The authors' experience in assisting Texas ISDs implement these programs will also be shared.

MASTER PLANNING: BUILDING SYSTEMS

Master planning in school districts historically involves developing and implementing a long-range educational plan, including facilities construction, to meet projected needs. Compiling information, policies, and statistical data about a district are parts of the process. The purpose of such a plan has historically been to provide a continuous basis for designing educational facilities and programs that will meet the needs of a community. Building systems master planning uses the same concept – developing a plan to meet long-range goals. However, this type of plan deals with the upgrade, maintenance, and renovation of building systems, the infrastructure and components of utility and technology related installations, such as electrical, mechanical, plumbing, data, and fire alarm. Just as school districts do master planning for overall educational needs, they should also have a master plan in place for building systems. A building systems master plan is also a short and long-range planning tool – a guide to the future. To be effective the plan should encompass all buildings at all campuses as well as auxiliary and support facilities.

Building systems master planning eliminates the time honored reactive method of addressing equipment needs: "putting out fires". Instead, a building systems master plan encourages a proactive approach by outlining the locations to be included, the scope of work, and a timeline or schedule for accomplishing that work. In this way expenditures, based on actual needs, can be budgeted, planned, and prioritized.

The Planning Process

The first step in the process is defining the customized plan. The scope and boundaries must be established, determining which facilities and systems are to be studied. A comprehensive plan will address, among other items, HVAC, lighting, controls, fire alarm, communications, building access, surveillance, piping, electrical service and distribution, and technology. Again, ideally all district facilities should be included to provide a comprehensive evaluation. Next, a comprehensive survey of each system included in the plan is conducted. Information relating to specific criteria for each type of system is collected. Thorough building walk-throughs are necessary to get all of the necessary data. The input of maintenance and other staff can also be very helpful in providing additional information. The data collected during the surveys is then analyzed and used in deciding whether to repair, retrofit, or replace. Developing solutions based on the

data analysis is the next step in the process. As a part of the solutions phase, estimates of probable costs are made and needs prioritized. Finally, the entire building systems master plan is documented and published.

As noted earlier, systems are evaluated according to explicit criteria. These standards must also be adapted for actual conditions in a given district. As examples, some factors for heating/air conditioning and lighting assessment are:

- Heating/Air Conditioning Evaluation Criteria
  - System type
  - Condition
  - Efficiency and operating costs
  - Capacity
  - Age
  - Comfort
  - Refrigerant type
  - Indoor air quality
  - Maintenance costs
  - Controls
  - Ventilation
  - Code requirements

- Lighting Evaluation Criteria
  - Type
  - Efficiency
  - Operating costs
  - Lighting levels
  - Controls
  - Code requirements

Appropriate evaluation criteria, as noted, are used to determine those systems that should be candidates for repair, retrofit, or replacement. Further analysis must then be made to decide which options to consider for new equipment.

Advantages of Master Planning

Building systems master planning offers numerous advantages. Obviously the mere existence of a comprehensive plan to address facilities needs is of great assistance. Some of the other benefits include:

- Assists in balancing financial resources, strategic and educational objectives, and functional needs
- Provides a logical roadmap
- Establishes priorities based on actual needs
- Allows for proaction rather than reaction
- Addresses out-of-sight items that are often overlooked
- Facilitates funding approval
- Improves budget forecasting
- Promotes operation and maintenance savings
- May extend the life of equipment and systems
- Reduces costly emergency repairs on old systems
- Improves estimating maintenance staffing needs
- Reveals opportunities for standardization
- May allow the immediate use of available funds
- Aids in the incorporation of new technologies
- Promotes energy efficiency
- Improves compliance with updated code requirements

Proceed with Caution

To be successful, a building systems master plan must avoid the pitfalls sometimes associated with the process. The most common error is not having a plan at all. Districts without a plan generally end up repairing and replacing equipment piece by piece as a response to failures and scrambling for funds to pay for the work. Second, the plans developed are often minimal, with shortcuts taken. Effective plans should be comprehensive in nature and take all facilities and all applicable systems into account. They should outline details of the condition of existing systems using valid evaluation criteria, compare possible options and give justification for the one selected, show projected costs for the chosen options, and prioritize the work recommended. Thirdly, building systems master plans should not just be tacked on to another plan or study. They should be developed separately, so that they are a focus all their own. Also note that, although energy savings may be an impetus for replacing some equipment, these plans are more than just an energy audit. Next, master plans must be customized for each district. A generic “one-size-fits-all plan” will not provide satisfactory results. Finally, an experienced engineering professional should be hired to compile any building systems master plan. All too often non-engineering professionals have been observed to focus only on the need for new classroom space or building modernization with little or no consideration of the infrastructure.

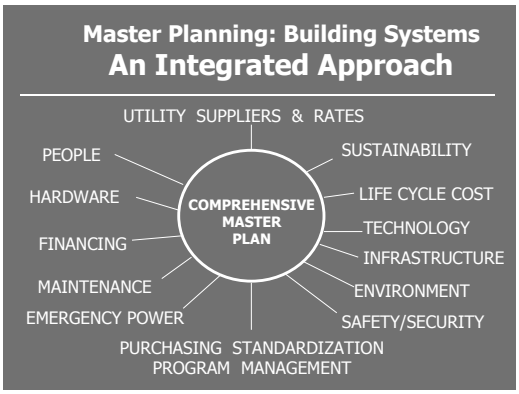

Figure 1. An Integrated Approach

A Comprehensive, Integrated Approach

Building systems master plans require an integrated approach. Although accomplished as a separate study, they must be developed and viewed in light of other available information and district policies. A comprehensive master plan must consider many different elements. Referring to Figure 1, look at each of the elements shown in the chart as "spokes" on the comprehensive master plan "wheel". They all are needed to balance the wheel and make it turn smoothly. Each must be taken into account when developing and implementing a building systems master plan. Taken together all applicable factors should influence the final decisions regarding repair, replacement, and retrofitting of equipment. Looking specifically at just a few of these "spokes":

People. People influence almost every other element shown in Figure 1. They install, operate, and maintain the equipment, and must live with the consequences of all decisions made, whether good or poor. The people factor includes attitudes and habits, awareness of good, efficient operating procedures, and the desire for improvement.

Building use, operation, and scheduling greatly influence energy costs and occupant comfort. The authors have observed some districts using energy managers as "human time clocks". They are kept running from building to building operating equipment rather than relying on modern controls (hardware).

Financing. Building systems master planning allows districts to prepare and budget for expenditures, considering the availability of funds from different sources and which of those offer the best option to pay for defined projects. Also, unanticipated funds that become available can be put to immediate use based on identified, prioritized needs.

Maintenance. Replacing aging equipment with new generally lowers maintenance costs as expenditures for material and labor to make emergency repairs are reduced. Funds not spent on these activities can then be better spent on other needs. On the other hand, address preventative maintenance as a part of building systems master planning. Determine what procedures and schedules are recommended to care for the new equipment. If implemented from the beginning, periodic maintenance can often improve equipment performance and lengthen its useful life.

Life Cycle Cost. The life cycle cost takes into account first cost plus operating costs over a system's entire life span. Though not the only consideration, life cycle cost analysis can aid in determining which equipment option is the best choice.

Technology. In schools the word "technology" is often used to refer to computers, media management, and associated cabling, etc. The impact of technology upgrades and improvements on the building and other systems (e.g. space, cooling load, electrical system capacity, etc.) must be addressed.

If equipment is being replaced, look at this as an opportunity to upgrade to available newer technologies. For new systems, purchase the most technologically advanced options that are practical, realizing that even these will become obsolete in the not-too-distant future. Also consider how systems will interface and how new equipment fits in with the district's overall technology plan.

Safety/Security. Various events including shootings, intrusions, hostage incidents, terrorist events, fires, and hazardous weather episodes can compromise students' safety. Therefore, systems to enhance safety and security should be included in master plans for building systems. Surveillance cameras, access systems restricting unauthorized entry, fire alarms, fire suppression, and intercom systems can all play a part in enhancing campus protection.

Environment. When discussing building systems and HVAC in particular, environment includes both a building's interior setting and the outdoors. Inside, indoor air quality (IAQ) is the focus. ASHRAE Standard 62 (Ventilation), incorporated into building codes, mandates that a given amount of outdoor air must be brought indoors in an attempt to improve IAQ. Older HVAC systems may not be designed to accommodate today's outdoor air requirements.

Therefore, building investigations must include assessment of existing HVAC capabilities in light of ASHRAE Standard 62. Moisture introduced by roof leaks, improperly installed or deteriorated windows, and inadequately sealed walls, etc. can also adversely affect IAQ. Look for evidence of these conditions and plan to correct them as well. Outdoors the type of refrigerant used in air conditioning systems is important. Production of many of the common refrigerants used in HVAC systems is being stopped because they contain chlorofluorocarbons (CFC). Studies have shown that these compounds potentially harm the atmosphere. Consequently, phase-out of equipment having CFC refrigerants should be included when planning.

Sustainability. Schools' use of energy efficient systems, renewable resources, and environmentally friendly materials – collectively known as "sustainability" or "low environmental impact" – are gaining popularity. Examples of lower environmental impact solutions include high efficiency lighting and HVAC systems, fuel cells, photovoltaics, solar hot water, waterless urinals, rainwater harvesting, and recycled and non-polluting materials. Some of these technologies have lower life cycle costs than traditional approaches and some higher ones; however, initial costs of all should decrease in the future as demand increases. So, give consideration to environmentally friendly methods whether for money savings, positive environmental impact, or demonstration projects as examples and illustrations for students.

Hardware. Equipment, or hardware, must be evaluated in detail during building systems master plan development taking numerous factors into account, including age, condition, functionality, efficiency, parts availability, maintenance costs, capacity, etc. Many school districts have used master planning to successfully gain approval for equipment upgrades on a prioritized basis.

Infrastructure. Often overlooked in building systems master plans are infrastructure items such as natural gas piping, chilled and hot water piping, condensate drains, electrical distribution equipment, and sewer lines. Typically those who only look at energy efficiency, especially when working from shared or guaranteed savings type contracts, do not address these components.

Communication. Although not shown explicitly as a spoke on the wheel, good master planning should promote communication across departmental boundaries. An integrated approach necessitates input and information from various sources regarding all the areas, or "spokes", shown. To illustrate, on more than one occasion the authors have observed unilateral technology implementation in schools by the technology group, only to discover after the fact that there is inadequate power or cooling capacity to handle the installations. In other cases, technology services personnel have attached large amounts of data cabling to ductwork. To their dismay they later learned that the ductwork was scheduled for replacement the next summer. Schools must, therefore, make interdepartmental communication an essential part of the planning process. These examples highlight how the integrated, comprehensive approach presented here can save the Owner money and frustration.

Other issues. There are several other issues related to building systems master planning worth mention. First, adopt an energy policy, energy management plan, and design guidelines. These will set standards for selecting equipment and systems in the future. Prepare building operating and use procedures, and initiate a preventative maintenance program. Having a set of guidelines to follow will help staff properly operate and care for equipment and thus lengthen its useful life. Additionally, prepare a technology plan. The district then has a roadmap for the application of technology, and can take this into account when specifying new systems and equipment included in the master plan. Also, integrate a purchasing standardization program into district policies. The implementation of these policies and procedures will enhance building systems and facilities management. Finally, update the plan periodically to account for work completed and changing needs.

Case Studies in Master Planning

Marshall ISD. Marshall ISD began producing an in-house facilities report, used in formulating a building systems master plan, some years ago. This process was formalized in 1994. Since that time a formal report has been updated and published each year. The report includes a historical summary as well as a presentation of future needs.

The historical summary reviews all recent significant improvements. These are categorized by funding source – general budget, bonds, tax notes and other loans, grants, gifts, and others. Anticipated needs are broadly divided into two areas: new facilities requirements and upkeep of existing buildings. Requirements are grouped by system/material type, including HVAC, roofing,

indoor air quality/mold issues, carpet, ADA compliance, energy management controls, and lighting. Supporting data is gathered from maintenance staff, engineers, architects, vendors, contractors, and other consultants. After all needs are identified they are prioritized. An estimated cost is also developed for each identified need.

In their planning Marshall ISD uses five priority levels:

- Priority A – Immediate attention needed. Special budgeting required.
- Priority B – Action needed in the next two to five years. Special budgeting required.
- Priority C – Can be addressed in the regular budget.
- Priority D – High priority for special program need. Special budgeting required.
- Priority E – Future wish list

With all of the above information at hand, a building systems master plan can be developed and published. Identified needs are listed and prioritized by campus with their probable costs. Proposed projects are also prioritized and totaled on a district-wide basis.

Energy savings has been one positive result of Marshall ISD's master planning building systems program. Through identification and replacement of older, inefficient air conditioning, heating equipment, and lighting, plus an aggressive energy management policy, the district has been able to actually reduce energy expenses even though total square footage has increased.

As examples, old single-stage, gas fired absorption chillers were replaced with new high-efficiency, electric chillers. Also, old inefficient steam boilers were replaced with high efficiency boilers. Fluorescent and high intensity discharge fixtures replaced incandescent lighting, and 32-watt lamps and electronic ballasts replaced 40-watt fluorescent lamps and magnetic ballasts. Computerized energy management controls capable of optimum startup, load shedding, demand control, night setback, and instantaneous monitoring were installed. Financing of these improvements came from:

- Implementing low-cost/no-cost maintenance and operating procedures
- Department of Energy grants
- Local operating funds
- Energy and maintenance savings generated by completed projects

The Marshall ISD school board allowed Mr. Wendell Jones, former Assistant Superintendent for Support Services, to use some of the savings in a "pay-as-you-go" program to upgrade building systems. For example, early on Jones took savings resulting from the previously described chiller, boiler, controls and lighting projects and replaced old chilled and hot water piping. This example highlights the fact that MISD addressed unseen infrastructure items that some approaches overlook.

James McClure, P.E. (co-author) first met Mr. Jones in 1984 at the Symposium on Improving Building Systems in Hot and Humid Climates. MISD's plan for building systems improvement and energy efficiency began at that conference. This example illustrates the benefit of investing employees' time and school district funds in quality conferences, seminars, and symposiums.

Through successful building systems master planning, Marshall ISD has been able to systematically replace older, inefficient equipment, aging roofs, and worn flooring; improve building environments; employ new technologies; and meet changing code requirements. Results include decreased energy costs and a reduction in maintenance costs as a percentage of the overall budget. In fact, although floor spaced increased 18.5% between 1984 and 2001, actual, non-adjusted energy costs per square foot declined by almost 50%. Therefore, more funds have been available to funnel into education and other programs.

Tyler ISD. Tyler ISD (TISD), located in east Texas, includes some 17,000 students in 25 campuses. A review in 1996 by the State Comptroller's Office listed several areas that needed to be addressed by school officials and the board of education. These topics included: needs awareness, deferred maintenance, technology and technology infrastructure, and planning and funding issues.

Subsequently, energy assessments conducted under the State Energy Conservation Office's School Energy Partnership Program revealed the potential energy savings that could be realized from various capital projects. As a result, a LoanSTAR low interest loan was obtained from the State of Texas to replace old, inefficient lighting in quite a few campuses with energy-saving lamps and ballasts.

SUMMARY OF RECOMMENDED HVAC PROJECT COSTS (IN $) BY PRIORITY AND SCHOOL
Tyler Independent School District

SCHOOL NAME	PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	PRIORITY 5	EMCS
AUSTIN ELEMENTARY	246,274		115,699			52,136
BELL ELEMENTARY			308,835			40,458
BIRDWELL ELEMENTARY			303,685			38,851
BONNER ELEMENTARY		402,378				45,512
CLARKSTON ELEMENTARY	160,416		281,298			50,213
DIXIE ELEMENTARY		358,959				52,380
DOUGLAS ELEMENTARY		331,279				52,015
GARY ELEMENTARY		429,888				43,344
GRIFFIN ELEMENTARY		422,849				49,129
JONES ELEMENTARY	29,068	207,218				41,298
ORR ELEMENTARY			371,710			44,794
OWENS ELEMENTARY					197,054	64,533
PEETE ELEMENTARY		284,227				35,564
RAMEY ELEMENTARY	390,110					47,679
RICE ELEMENTARY	99,192		461,151			65,046
ST. LOUIS ELEMENTARY	314,400					40,215
WOODS ELEMENTARY			276,579			53,464
BOULTER MIDDLE				572,145		64,776
DOGAN MIDDLE			380,886			46,596
HOGG MIDDLE		536,958				50,687
HUBBARD MIDDLE				591,409		98,876
MOORE MIDDLE	12,000		599,145			59,479
STEWART MIDDLE	145,771		242,237			75,380
ROBERT E. LEE HIGH				1,558,136	740,357	153,385
JOHN TYLER HIGH	115,902		410,800	106,794	101,845	222,600
ADMINISTRATION BLDG		405,376				57,357
TOTAL ESTIMATED COST	1,513,133	3,379,132	3,752,025	2,828,484	1,039,256	1,645,767

Table 1. Summary of HVAC Costs by School

Aged chillers, boilers, and multizone air conditioning units at the district's two high schools were also replaced. However, more needed work could have been done were funds available.

In 1997 TISD authorized the development of a detailed building systems master plan. School officials had documented plans outlining needed work such as parking lot renovations, roof repairs, and asbestos abatement, but not for building systems. Steps were then taken to produce a building systems master plan, which would provide officials with information to identify needs, budget, prioritize, and plan for HVAC replacements and lighting retrofits. Table 1, an example of many created for the report, summarizes the HVAC work needed by school and priority level.

Studies revealed that approximately $15 million in work was needed to replace inefficient and poor lighting and old, deteriorated, and malfunctioning HVAC units, and to add energy management controls. All existing equipment was evaluated using explicit criteria. For example, projects addressing lighting and HVAC equipment were prioritized as follows:

- Lighting
  - Priority 1 – Schools with low light levels and old (magnetic type) ballasts
  - Priority 2 – Schools with more than 50% old ballasts
  - Priority 3 – Schools with less than 50% old ballasts

- HVAC
  - Priority 1 – Significantly deteriorated equipment and maintenance problems; major comfort problems
  - Priority 2 – 19 years old or older equipment; little or no outside air and tight construction; deteriorated equipment
  - Priority 3 – 19 years old or older equipment; little or no outside air and loose construction; deteriorated equipment
  - Priority 4 – 19 years old or older equipment; schools with provisions for outside air
  - Priority 5 – 19 years old or older equipment

The building systems master plan was then used in the development of a $32 million bond proposal, which also included $17 million in needed electrical additions for technology, fire alarm and intercom system upgrades, and other non-building systems items noted earlier. Voters approved the entire bond package in 1998. While the projects included were originally scheduled for completion over a five-year period, due to the rescheduling of some items the work was done in approximately four years. Furthermore, the actual competitive bid pricing was less than the budgeted amounts in the building systems master plan.

Recently, the 1997 building systems master plan was updated to reflect the work done in the 1998 bond package and to include recently identified

needs. The revised document looks at the years 2004 through 2020. At some point replacement of the equipment installed as a result of the 1997 plan will be required and is included in the update. Specific information is shown for each school as well as aggregate data for the entire district. Thus, the building systems master planning has become a continuous process.

For TISD comprehensive evaluations at each school led to prioritization of true overall needs. Completion of the work recommended in the building systems master plan has yielded positive, long-term results such as:

- Ability to respond proactively rather than reactively
- Addressing needed retrofits
- Better occupant comfort
- Energy cost reductions from more efficient equipment
- Improved code compliance
- Keeping up with advances in technology
- Formulation of a preventative maintenance plan to keep new equipment running efficiently
- Addressing concerns noted in the Comptroller's original report

A Texas ISD. Advance planning can often eliminate the need to make major decisions at inconvenient times. Consider the following example illustrating this point.

A high school had two chillers, although only one was operational. The one functioning chiller was 23 years old and had not been properly maintained. During the summer, immediately before the start of classes, the cooling tower associated with this system began leaking and was replaced on an emergency basis and at a premium price Shortly thereafter the one operating chiller failed. As time did not permit the ordering and installation of a new one, the existing chiller was repaired, again on an emergency basis. Now the district had a running but inefficient 23 year-old chiller containing a restricted chlorofluorocarbon (CFC) refrigerant, and a brand new cooling tower.

A building systems master plan could have eliminated these expensive, emergency expenditures. Investigations to prepare the plan probably would have revealed the condition of the cooling tower and led to its replacement through normal, less expensive channels. A good plan also would have taken into account the fact that the chiller was 23 years old, poorly maintained, contained a CFC refrigerant, and was near the end of its useful life. The district in question could have then been able to explore all available options, plan and budget for replacements, secure funding, and avoid costly emergency repairs.

PURCHASING STANDARDIZATION PROGRAM MANAGEMENT

As educational campuses expand, their owners must make large capital investments. Most of them use design, construction, and equipment procurement processes that have been time and cost effective in the past. However, a new approach has proven to provide even more efficiency and cost savings, while supplying a level of standardization that can improve facility management throughout the lifetime of the facilities.

In typical campus expansion and renovation programs, every project is bid separately, with each potentially designed, engineered and constructed by a different team. A school district often spreads design among a few engineering and architectural firms, but chooses a different contractor for every project, based primarily on which construction firm offers the lowest bid. This system is generally preferred for no better reason than that it is the way things have always been done. The concept itself is fine, but owners may benefit greatly from providing procurement guidelines to each building team. If the owner sets specific purchasing standards for all facilities, they can realize many significant benefits. This effort adds consulting costs to the planning process for additional up front work required, but these fees are nominal when compared to the potential for overall cost savings.

Purchasing standards are relatively common in many facets of academic business management. Standardized purchasing of office supplies simply means receiving preferred pricing from one vendor. Also used in coordination with some facilities management programs, standardized purchasing allows bulk purchase pricing for inventoried items such as light bulbs and cleaning supplies. However, purchasing standardization, as depicted in this paper, is a concept with much grander applications and opportunities for six-digit savings.

Campus master plans that include building systems, phasing, and priorities, allow facility owners to implement purchasing standardization and then receive guaranteed pricing on the equipment for all buildings. This means that explicit, preferential pricing is set and will remain intact throughout the life of the master plan process – a timeframe that can easily span several years. This preferential pricing

applies to as many items as an owner is willing to standardize, but typically refers to major purchases like air conditioning systems, energy management control systems, fire alarm systems, and other large-ticket items. Standardized pricing is particularly significant primarily because manufacturers and suppliers are very anxious to provide deep discounts on large quantities of product sales to be purchased over a specified period of time.

In a traditional construction scenario, a building team is responsible for one or maybe two buildings. The construction bids depict the amount that will be spent on equipment purchases. A contractor or subcontractor will then contact equipment manufacturers or suppliers and negotiate a price for a specific item. For example, a classroom building may require 60-75 air conditioning units. The contractor will then shop for the best price for multiple units and pocket any savings.

In contrast, with standardized purchasing, an owner will hire a professional engineer to determine how many air conditioning systems will be needed for all buildings included within the current multi-year master plan. Instead of obtaining a price for 60 or 75 air conditioning units, like the contractor described above, the engineer will negotiate a price for perhaps 800 or even 1200 units. The pricing for the expanded order will logically result in much deeper discounts. The savings will return directly to the owner, rather than adding residual income to the contractor's pocket.

State-sponsored colleges and school districts in Texas are required to obtain multiple bids for major purchases, which could seemingly deter the standardized purchasing process. However, multiple bids can be obtained in standardized purchasing just as they are in traditional bidding, so there is no concern over circumventing state-mandated policies.

Standardized purchasing also offers flexible parameters to accommodate revisions along the road to master plan completion. Knowing the strategies for developing bids or proposals to protect the owner is the key to PSPM success. For example, if more equipment is needed than originally anticipated, methods and strategies are pre-determined and built into the specifications to prevent price gouging. Well-written purchasing agreements also ensure that the owner gets full pricing returned if quantities are reduced, rather than the frequent 50-cents-on-the-dollar.

Yet standardization does more than save money on first costs. There are many more benefits in addition to minimization of first costs. Since all equipment is from one manufacturer, the number of inventory or stock items is reduced. The procurement process is simplified, adding efficiency and economy to the facilities management function. Maintenance personnel are also able to complete their work more effectively. If the staff only needs to know the intricacies of one brand of air conditioning system, they will be able to concentrate on the specific nuances of that equipment and not be confused and frustrated by the myriad of different specifications and specialized requirements of equipment provided by various manufacturers. In essence, it is much like maintaining a fleet of vehicles. If all of them are 2003 Thunderbirds, then one only needs to stock parts and know the specifications for one model. If the fleet consists of Thunderbirds, PT Cruisers and Chevy SUVs, one has to maintain more complicated records, warehouse a wider stock of repair parts, and understand the unique characteristics and requirements of each type of vehicle.

While this standardized purchasing process is not widely used in most academic settings, its impact is evidenced through its implementation in a variety of Texas public schools.

Case Studies in PSPM Savings

Below are examples that document actual savings resulting from implementation of the Purchasing Standardization Program Management (PSPM) process. All independent school districts cited are located in Texas.

- Lewisville ISD used PSPM to purchase media management, fire alarm, intercom, security, and energy management control systems for various schools and achieved a purchase savings of more than $1 million.
- Tyler ISD bought district wide energy management controls that were installed in phases during a three-year period. The bulk pricing strategy saved them $320,000. They also purchased district wide lighting upgrades using PSPM and saved additional money as compared to other procurement options evaluated.
- Using standardized purchasing strategies, Duncanville ISD, saved more than $1 million dollars for their current bond program. PSPM saved $880,000 in first cost of air-conditioning equipment and energy management controls. Consequently, design fees based on material costs were reduced by $53,000. Higher efficiency air-conditioning equipment, made more affordable due to these savings, will result

in another $180,000 per year in energy cost savings. Also, contractor fees will be lower since they are based on construction costs. Finally, maintenance costs will be reduced as well.

- Sherman ISD saved more than $2 million by pre-purchasing air conditioning, energy management, fire alarm, communications and technology systems for their $49 million bond construction program.

SUMMARY

Building systems are an often-overlooked aspect in facility master planning. The integrated, comprehensive systematic approach described in this paper yields a master plan containing a prioritized list of actual needs along with their probable costs. As the process calls for thorough investigations of facilities, hidden and often overlooked items may be revealed. School officials can utilize this plan to forecast future budget needs and make use of available funds.

Purchasing Standardization Program Management, or PSPM, is a method that can be implemented alongside building systems master planning and bond issue development. PSPM can offer significant money savings through the purchase of equipment in bulk from a limited number of suppliers over an extended period of time. A domino effect of savings includes reduced construction fees and maintenance costs. In purchasing knowledge is power. Possessing the knowledge and spending the necessary time and attention to develop the proper strategies for protecting the Owner is the key.