Borger Independent School District

FACILITIES MANAGEMENT REVIEW

Conducted by SCRS, Inc. and Facility Engineering Associates, Inc. for the Legislative Budget Board

January 2009

LEGISLATIVE BUDGET BOARD

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January 27,2009

Mr. Clifton L. Stephens
Superintendent
Borger Independent School District

Dear Mr. Stephens:

The attached report reviews the management and performance of the Borger Independent School District's (BISD) facilities operations.

The report's recommendations will help BISD improve its overall performance as it provides services to students, staff, and community members.

The Legislative Budget Board engaged SCRS, Inc. and Facility Engineering Associates, Inc. to conduct and produce this review, with LBB staff working in a contract oversight role.

The report is available on the LBB website at http://www.lbb.state.tx.us.

Respectfully submitted,

John O'Brien
Director
Legislative Budget Board

cc: Ms. Elaine Feese
Mr. Johnny Rusten
Mr. Robert Bradley
Mr. Gary Schneck
Mr. David Brandon
Mr. Todd Harris
Ms. Charlotte Williams

BORGER INDEPENDENT SCHOOL DISTRICT FACILITIES MANAGEMENT

Texas school districts are challenged with providing instructional services in the most cost-effective and productive manner possible. Effective and efficient programs and a well-designed instructional program determine how well a district meets its goal of educating children. In support of this goal, the facilities organization is tasked with developing effective facilities operations and maintenance programs to provide safe, productive, and clean environments where students can learn.

Borger Independent School District (BISD) is situated in the city of Borger, close to the southern edge of Hutchinson County, Texas, approximately 50 miles north-east of Amarillo. Its boundaries capture 52 square miles of properties in the Borger area. Borger is surrounded by refineries and chemical plants operated and owned by a handful of well-known, multi-national corporations. These plants provide most of the employment opportunities available to residents of this region. They are located, however, outside of the taxing district supporting BISD.

The 2000 Census identifies the population of the entire county at approximately 24,000 individuals. Approximately 60 percent of the county's population resides in Borger. School district officials indicate that the population numbers have, at best, remained level since the 2000 Census was taken. School enrollment figures are reflective of this trend, having decreased from 2,882 pupils in 2006 to 2,759 in 2008. Most of Borger's population resides within a few miles of city center.

Most of the core school buildings are at least 50 years old (**Exhibit 1**). BISD added new wings to some of these facilities, or has made extensive use of "portables" in order to meet space requirements. Since the successful bond election in 2006, the district has been able to commit nearly $40 million to the construction of a new elementary school and to mitigating a number of issues identified through the completion of a facilities needs assessment.

The BISD organizational structure is presented in **Exhibit 2**. The responsibilities associated with managing the Operations and Management (O&M) functions for BISD fall under the Executive Director for Transitional/Non-Instructional Services, included in the category labeled "Environmental Services."

The following sections provide a summary of the review team's findings and recommendations regarding facilities management issues for BISD. The information is based on field visits, interviews, document review, and observations completed at BISD in the summer of 2008.

ACCOMPLISHMENTS

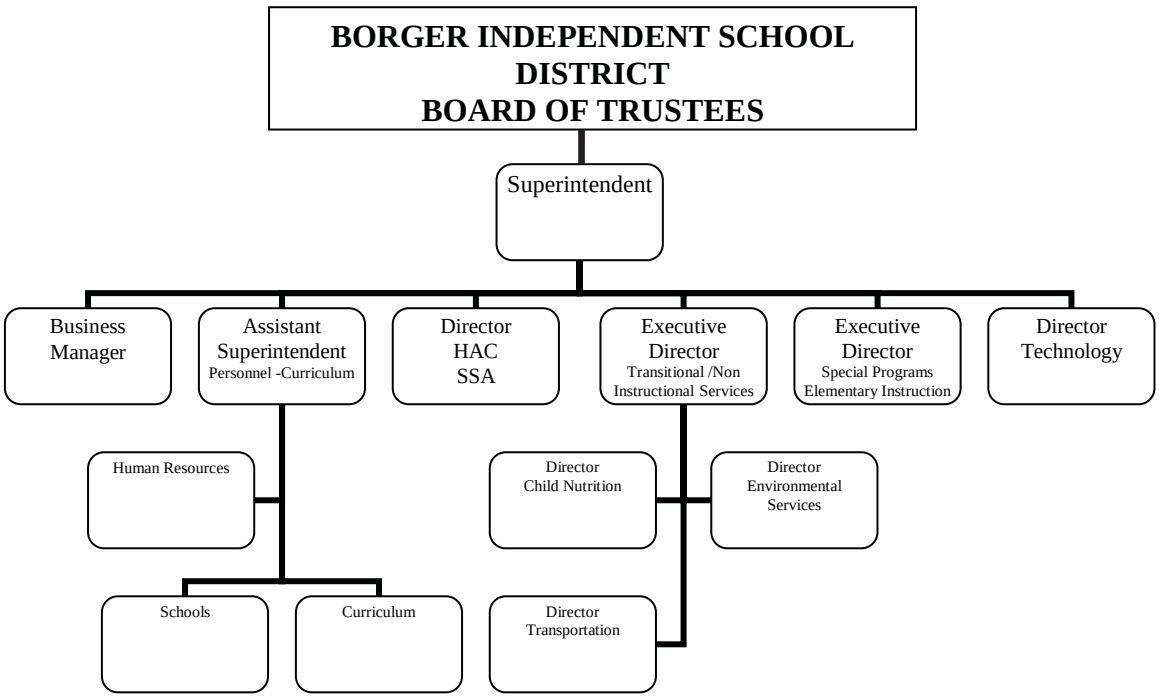
- Accomplishment #1 – BISD was successful in its endeavors to garner support for a significant school bond, the first one in 50 years, enabling BISD to initiate a number of improvement projects as well as the construction of a new elementary school facility. This

EXHIBIT 1
BISD FACILITIES INVENTORY
MAY 2008

FACILITY	YEAR BUILT	LAST IMPROVEMENTS	SQUARE FEET
Borger High School	1946	2000	182,903
Borger Middle School	1959	2001	119,640
Paul Belton Early Childhood Center	1956	2003	39,164
Crockett Elementary	1958	2000	41,615
Gateway Elementary	1950	2003	42,115
Administration Complex	1928	2003	38,950
South Campus	1928	1992	31,689
Stadium Complex	1958	2004	6,713
Band/Soccer Field	2004	2004	N/A
TOTAL			**502,789**

NOTE: Not applicable (N/A)
SOURCE: Executive Director for Transitional and Non-Instructional Services, BISD..

EXHIBIT 2
BISD MAINTENANCE ORGANIZATION CHART
MAY 2008



SOURCE: Executive Director for Transitional and Non-Instructional Services, BISD.

was the first bond election that passed, even as one for a new hospital failed only a few years prior to this event.

- Accomplishment #2 – As a direct result of the bonding opportunities, BISD will be able to fulfill its plan of eliminating an entire fleet of "portable" classrooms.
- Accomplishment #3 – BISD expects to have its first Leadership in Energy and Environmental Design (LEED) registered facility completed and certified at the start of the 2008 school year.

FINDINGS

- Finding #1 – BISD does not have a current, complete inventory of capital replacement or capital upgrade needs based on regularly scheduled facility assessments.
- Finding #2 – BISD is not able to compete effectively for skilled staff to work in its maintenance area with other major employers in the Borger area.
- Finding #3 – BISD has no design guidelines to steer the design of future upgrades or construction projects. Any guidelines that may have evolved during current design processes are not expected to survive the completion of current projects, since they are not documented except in project notes.
- Finding #4 – Members of the facilities maintenance staff had minimal opportunity to provide input into the design processes associated with current projects, nor in reaching any of the "value engineering" decisions subsequently made by district officials. Value engineering is defined by the General Services Administration as an organized effort directed at analyzing designed building features, systems, equipment, and material selections for the purpose of achieving essential functions at the lowest life cycle cost consistent with required performance, quality, reliability, and safety.
- Finding #5 – The maintenance staff is almost exclusively in a "response mode" as they react to complaints or reports from school staff. Except for the replacement of filters, and some summertime inspections, there is minimal investment in any type of preventive maintenance program.
- Finding #6 – There is consensus that the composite condition of the school facilities is only "average."

- Finding #7 – There is no clearly defined protocol for filing trouble reports with the maintenance staff.
- Finding #8 – There is an absence of facility management information technology, such as an automated work management system. This makes it difficult to track performance and obtain good data to make decisions based on factual and retrievable data.
- Finding #9 – BISD is in the early stages of implementing an energy conservation program. Significant opportunities remain for further enhancements to this effort.
- Finding #10 – In several instances, building occupants inadvertently create conditions that are unsafe and in violation of fire codes. There is also evidence of other code conflicts, such as missing exit signs, which persist without being resolved.
- Finding #11 – Borger High School does not offer a logical or safe flow for its occupants, as they have to commute on a timely basis from one class session to the next. This also creates a potentially hazardous situation when it becomes necessary to evacuate in case of an emergency.

RECOMMENDATIONS

- **Recommendation #1: Establish a formal process and schedule to perform facilities needs assessments (facility condition assessments)**. BISD has an opportunity, as the new elementary school building comes on line and other pressing needs have been addressed, to develop a prioritized listing of its remaining capital requirements. The relative age of most of the district's assets suggests that a comprehensive list of needs will enable the district to develop strategic plans for its facilities. A current inventory of "deferred maintenance" needs as well as programmatic requirements will help identify the most critical needs as funding becomes available.
- **Recommendation #2: Evaluate current job descriptions and associated wages and improve training opportunities, with the goal of improving recruitment and retention of support staff.** BISD may continue to find itself in a difficult position of having to compete in a relatively small labor pool with large employers in close proximity. Competitive wages are only one method that needs to be explored. Other forms of recognition and development need to be part of the solution.
- **Recommendation #3: Develop a set of design guidelines that will steer the design activities of future design teams on future projects.** Design guidelines can help provide consistent standards in materials used as well as aesthetics, and reduce the amount of late decision-making that frequently occurs on construction and remodeling projects. Providing a set of guidelines that define expectations by the owner can help avoid disappointments such as not receiving all the desired security features in projects currently in process. They can also help guide decision-making on the part of maintenance personnel.

  With a new facility coming on line soon, district leadership has an ideal opportunity to establish additional sets of standards, guidelines, goals and objectives guiding activities, impacting building condition and appearance, with input from a wide variety of stakeholders, including building occupants and non-instructional staff.

The standards should identify formalized processes for the following:

- master planning;
- school design and performance guidelines;
- design guidelines;
- value engineering and post-occupancy reviews;
- maintainability reviews during design phases;
- commissioning;
- facilities documentation exchange and control;
- facilities management information standards;
- capital needs assessment;
- preventive maintenance programs; and
- facilities performance measurement (key performance indicators).

- **Recommendation #4: Establish a project communication process soliciting input from parties impacted by the design characteristics of a project, supported by a two-way communication link with the designers.** It is important that stakeholders, including facilities staff as well as educators and other administrators with an interest in a project, have the opportunity to provide constructive input and receive corresponding feedback during the design phases of a project, before it enters into the construction phase. This will frequently result in a better project, often decreasing

the number of change orders during construction, and creating cost avoidance after acceptance of the project.

- **Recommendation #5: Develop a work scheduling philosophy based on a more aggressive preventive maintenance concept and clearly articulated standards.** The support staff performs a wide variety of duties, partially because they are often in a mode of "putting out fires." This is expensive and inefficient use of their talents and time. Some of their tasks could be more efficiently performed by generalists. Having clearly identified standards in place and expectations defined can lead to improved productivity and enhanced functioning of buildings and critical systems.
- **Recommendation #6: Develop a set of building condition and appearance standards.** BISD leadership has an opportunity to establish goals and objectives for building condition and appearance, with substantial input from building occupants as well as non-instructional staff. This set of standards can then be monitored and measured across all facilities in the district.
- **Recommendation #7: Design and implement a consistently applied request protocol for the various types of needs that individuals in the schools might experience.** Having a clearly defined and widely shared process will help reduce the number of reports that may currently fall through the cracks, while helping maintenance staff schedule their workload.
- **Recommendation #8: Implement facility management information technology in the form of an automated work order management system** (computerized maintenance management system–CMMS).
- **Recommendation #9: Identify and implement opportunities for additional energy conservation with methodologies for measurement and verification.** The district has made a start at energy conservation, supported by a directive from the superintendent. However, there is currently no way of showing success as a result of these intentions, and numerous other opportunities remain for significant additional progress. The district also has a wonderful opportunity at this time to build further onto its success with the LEED certification of the new elementary school.
- **Recommendation #10: Assign the responsibility for safety compliance and emergency management to an individual having the time and skills to perform those important functions.** This responsibility currently resides with an individual who already has unrelated duties. Because of those other job responsibilities and their time requirements, this person's opportunity to design an emergency operations plan, with its corollary responsibilities, may be limited. Similarly, the responsibilities with administering a safety program on behalf of the district may be compromised.
- **Recommendation #11: Authorize a study to identify issues and solutions associated with student flow and egress at the high school, and make its implementation one of the top priorities in the capital projects plan.** Some classrooms or other spaces are located in diverse locations with restricted access by the piecemeal configuration of the buildings. Individuals are expected to travel up and down stairs, go outside and back in as they make their way from one location or class session to the next. Some of the existing conditions also make emergency egress a risky endeavor. This collection of conditions should receive attention as the topmost priority after the new elementary school's completion.

DETAILED ACCOMPLISHMENTS

SUCCESSFUL BOND ELECTION

Accomplishment #1 – BISD was successful in its endeavors to garner support for a significant school bond, the first one in 50 years, enabling BISD to initiate a number of improvement projects as well as the construction of a new elementary school facility. This was the first bond election that passed, even as one for a new hospital failed only a few years prior to this event.

Leadership at BISD was successful in obtaining community support on a school building bond election. This is particularly impressive for two reasons: (a) the community had rejected a bond recommendation for improved hospital facilities only a few years earlier, and (b) this is the first bond issue passed in support of schools in over fifty years. This successful event enabled the construction of a new 110,000 square foot elementary school, plus the resolution of a significant number of other issues, based on a one-time facilities assessment performed by an outside consultant.

The district had in its possession a compiled list of needs that were to be resolved through the funding made available through the bond, if approved. This list included roof repairs and replacements, Heating, Ventilating, and Air Conditioning (HVAC) enhancements, electrical system improvements, and mitigation of code issues. This BISD Facilities Assessment Plan ranked its assets with a Facilities Assessment Rating, which indicated that there was a definite need for renewal activities and other improvements. BISD administrators effectively used this information to impress the importance

of this bond issue on the voters. District personnel indicate that this approach helped assure success for the multi-million dollar bond election.

ELIMINATION OF "PORTABLE CLASSROOMS"

Accomplishment #2 – As a direct result of the bonding opportunities, BISD will be able to fulfill its plan of eliminating an entire fleet of "portable" classrooms.

Currently, BISD uses 17 portable classrooms to satisfy its space requirements. The intent is to have all of these units eliminated by the start of the 2008-09 school year. This is made possible through the construction of the new elementary school, and subsequent creative space reassignments, allowing the contractor to complete additional remodeling and upgrade projects in existing buildings.

The "portables," although they fulfill a need, have a number of code and regulatory issues associated with them, including with the Americans with Disabilities Act (ADA). There are other safety and fire code issues associated with these assets. Their removal will both enhance the appearance of each campus, while eliminating serious risks and liabilities. The district has found a buyer for these units, providing some limited additional financial resources that can be applied to the mitigation of other facilities needs currently on the district's backlog list.

LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) CERTIFICATION

Accomplishment #3 – BISD expects to have its first LEED registered facility completed and certified at the start of the 2008 school year.

The BISD Board of Trustees indicated a strong desire for the new elementary school to be LEED certified. This decision represents a unique commitment for the district, and one that had not been previously explored.

LEED certification is not only about energy conservation. Case studies of existing LEED certified buildings across the country suggest that 61 percent of the points earned through LEED sensitive design are associated with non-energy measures. Indications are that the project will earn enough points to reach "LEED Certified" level. This project emphasizes the use of materials that are produced entirely of or contain recycled products. The project will also take advantage of high efficiency HVAC units, insulation, and Low-E glazing systems.

This process has proved to be a learning curve for district personnel, as well as designers and the subcontractors working on the project, yet everyone remains committed to the goal. Interviews with the designers, the contractor, and district representatives indicate that all participants are willing to remain committed, even as such planning presents additional financial burdens to the project.

DETAILED FINDINGS

FACILITIES NEEDS ASSESSMENTS

Finding #1 – BISD does not have a current, complete inventory of capital replacement or capital upgrade needs based on regularly scheduled facility assessments.

Recommendation #1: Establish a formal process and schedule to perform facilities needs assessments (facility condition assessments). BISD has an opportunity, as the new elementary school building comes on line and other pressing needs have been addressed, to develop a prioritized listing of its remaining capital requirements. The relative age of most of the district's assets suggests that a comprehensive list of needs will enable the district to develop strategic plans for its facilities. A current inventory of "deferred maintenance" needs as well as programmatic requirements will help identify the most critical needs as funding becomes available.

BISD is the steward of approximately 500,000 square feet of building space. The nature of these buildings varies from school buildings with science laboratories to warehouses and from gymnasiums to office space.

Much of the building inventory dates back at least 50 years, with a handful of the structures dating as far back as the 1920s. District records show that, historically, the district has had only a moderate success at upgrading several of the facilities and related systems. Conversations with district staff suggests that, prior to activities associated with the bond issue, the process encouraged individuals to submit a list of needs on an annual basis. The composite of those lists was reviewed and prioritized by senior administrators at the district level. As funding became available, the district was able to whittle away at those lists. As commonly happens with such processes, the needs that were resolved may not have addressed the most critical issues.

In preparation for the school building bond election, the district acquired the professional services of Parkhill, Smith & Cooper, Inc., whose representatives led walk-through inspections of the district's facilities. Large numbers of stakeholders participated in those walk-throughs, including some of the maintenance staff. The lists that were generated through this process served as a starting point for the upgrade activities ultimately funded through the influx of school building dollars.

It appears that this document (*Major Renovations & Deferred Maintenance*) was a one-time project, without an articulated

commitment to keep it up-to-date as district conditions and priorities change. Since this list was generated three years ago, no new or additional items have been formally added.

The district should establish a process and a database that provides a perpetual list of facility needs. These needs should be identified by qualified and trained personnel, using internal staff that has been well-trained for such activities, or outside consultants. The items on the list should be accompanied by a fairly reliable budget estimate, and should receive a priority rating. The district may choose to establish a relationship with an estimating firm to help scope projects placed on the capital needs list. While there is a cost associated with this service, having reasonable budget estimates available will enable administrators to more effectively plan their capital strategies. Having access to credible budget estimates may help prevent the need to downsize repair and improvement projects currently funded under the existing bond. It will also provide another tool that can help prioritize projects, or help determine their ultimate fate.

To contain cost, the district should consider going through an initial prioritization process, with the goal of only obtaining budget estimates on mission critical items that are most likely to be completed in the upcoming five year period.

The inventory should identify the full range of needs associated with the effective lifetime stewardship of buildings, from code compliance to aesthetics, from creature comfort to curb appeal, while also considering changes in programmatic needs or space utilization. Staff should feel encouraged to add additional items to the list (with appropriate reviews) as they become aware of those needs. Items on the list should be prioritized based on mission criticality. If successful, this routine can help avoid the annual ritual of creating a wish-list which may contain mostly those items remembered in reaction to recent events.

This type of inventory will provide useful information to future designers and contractors tasked to remodel portions of facilities, by having access to information describing current conditions.

An additional application of the knowledge gained through a facilities condition inventory is the establishment of a Facilities Condition Index (FCI). If the sum of the estimated costs of a building's total needs and deficits exceeds a predetermined percentage of that building's current replacement value, the district should develop a strategy for the replacement of that building. This threshold is often placed at 60 percent. Thus, an assessment of needs for Borger High School could result in an FCI greater than 60, indicating that the district needs to develop a strategy for its replacement.

Most public and private school systems generally use some form of facility condition assessment or life cycle analysis to determine backlogs of maintenance and repair and assess their facility needs. Findings and recommendations of best practices in facilities asset management (and facility condition assessments) have been researched and reported by the National Research Council independent of the specific approach. Key components to an asset management program according to the National Research Council include:

- standardized documented process that provides accurate, consistent, and repeatable results;
- detailed ongoing evaluation of real property assets that is validated at predetermined intervals;
- standardized cost data based on industry-accepted cost estimating systems (repair/replacement); and
- user-friendly information management system that prioritizes deferred maintenance (DM) and capital renewal (CR).

The goal of an asset management program is to conduct facility condition assessments and create a facility investment plan that is:

- rational;
- repeatable;
- recognizable; and
- credible.

Asset management plans should independently validate funding requests and provide consistent and credible information to aid in appropriately allocating funding for major facility maintenance projects. The plans should support funding decisions to ensure equitable distribution of funds among schools and ensure proper stewardship of the facilities.

The benefits of preparing facility asset management plans by conducting baseline facility condition assessments (FCAs) include:

- obtaining objective and credible data to make informed facilities investment decisions through prioritizing needs;
- streamlining facilities management processes and reducing the total cost of ownership;
- improving the condition of school facilities;
- extending the life of assets through proper maintenance and repair funding and decisions;

- minimizing safety and security risks at school facilities;
- minimizing the disruption to teachers and students caused by facility system failures;
- enabling optimal use of facilities and infrastructure in support of the educational mission; and
- improving overall stewardship of facilities and maximizing return-on-investment for district stakeholders.

If internal resources are not able to accomplish this task, additional resources (i.e. consultants) could be hired to aide in the comprehensive assessment and program set up. Outside consultants could typically be procured for $.10/square foot to aide in the assessment. Multiplying $.10/ square foot times the district's total square footage (502,789 square feet) equates to approximately $50,279.

STAFF RECRUITMENT, RETENTION, AND TRAINING

Finding #2 – BISD is not able to compete effectively for skilled staff to work in its maintenance area with other major employers in the Borger area.

Recommendation #2: Evaluate current job descriptions and associated wages and improve training opportunities, with the goal of improving recruitment and retention of support staff. BISD may continue to find itself in a difficult position of having to compete in a relatively small labor pool with large employers in close proximity. Competitive wages are only one method that needs to be explored. Other forms of recognition and development need to be part of the solution.

Since the maintenance support staff is relatively small at BISD, every individual who leaves the district's employment also leaves a vacancy that is hard to fill. A primary reason for this reality is that large employers in close proximity to Borger offer union wages that are considerably higher than entry-level wages offered by the district.

The district may never be able to match the pay scales offered by neighboring employer groups. However, some of the district's job descriptions pertaining to district staff may be understated, which can perpetuate inadequate or non-competitive compensation. Given current market conditions both locally and nationally, it is appropriate for the district to re-evaluate both, and make adjustments as appropriate and feasible.

One opportunity may lie in allowing journeyman-level employees to apply their unique skills and talents in a more dedicated and challenging manner, and reduce the use of their time spent in performing mundane tasks. For instance, introducing a carefully developed preventive maintenance program may allow the definition of job descriptions that in turn encourage higher compensation.

Another tool used effectively by employers is an enhanced training program. Though not always seen that way, training is a form of recognition that employees often appreciate, while creating stronger bonds of loyalty between management and the employee. Interviews indicate that, although some training does occur at BISD, it is rather a hit-and-miss approach rather than a structured program.

Not investing in an ongoing training program can result in increased on-the-job accidents, inefficient staff, and required repeat work. Adequate and continuous training is a key step in the development of individual performers. Good training is timely, informative, effective, and keeps employees, customers, and visitors healthy and safe.

Best practices show that 2-5% of a facility department's overall personnel budget should be spent on training and development, including cost of wages, supplies, and other related costs. Although most organizations do not spend to this level, this best practice indicates the importance of training. Some experts maintain that investing in good training practices does not constitute an additional cost. Rather, it tends to provide a favorable return-on-investment.

Training provides the opportunity to educate the employees in the most effective way that they can utilize available resources and to ensure that people understand the environmental rules and regulations regarding their facilities and grounds. Information can be shared not only about the facilities and spaces, but also about the larger district environment and the industry in general.

Generally, there are four basic areas of training focus:

- training new employees in the maintenance and use of the facilities and grounds;
- training current employees who have changed task or function;
- training all employees when new statutes need to be enforced; and
- training all employees when new equipment or tools are purchased.

Managers must think creatively about how to provide high-quality training opportunities in the face of time and budget constraints. According to *The Planning Guide for Maintaining School Facilities* (the National Center for Education Statistics), the district's leadership may choose to examine some of the following opportunities:

- sharing training costs with other organizations on a collaborative basis;
- hiring expert staff or consultants to provide on-site supervision during which they actively help staff improve their skills while still on-the-job;
- developing training facilities, such as training rooms in which equipment and techniques can be demonstrated and practiced;
- offering tuition reimbursement programs which provide educational opportunities to staff who might not otherwise be motivated to improve their knowledge and skills; and
- building training into contracts so that vendors are obligated to provide training at either an on-site or off-site training center as a condition of the purchase of their products.

Additional suggestions include:

- utilizing current staff to perform training with respect to their expertise; and
- compounding the effects of training by having employees who have attended training report to those who were unable to attend due to resource restrictions.

Training typically refers to learning opportunities specifically designed to help an employee do his or her job better. "Professional Development" has a broader meaning which includes expanding participant's knowledge and awareness to areas outside their specific job duties, yet still contributing to the overall well-being of the organization. Such topics might include:

- asbestos awareness;
- energy systems;
- building knowledge;
- first aid;
- emergency response;
- biohazard disposal;
- technology use;
- universal precautions;
- right-to-know;
- first responder awareness;
- first responder operations;
- sexual harassment;
- communication skills; and
- customer service.

Ongoing assessments of training efforts, including all aspects of the experience, should be built into the program for educating employees. For instance, an effective work order management system will allow the conscientious manager to evaluate progress in productivity, reducing call-backs, or down-time of equipment. This type of monitoring can serve multiple functions: track the effectiveness of the training and support efforts designed to obtain increased resources supporting additional training activities. Monitoring progress can also help identify areas where further training may be appropriate.

BISD should develop individual staff training plans for each employee. District leadership should conduct or encourage formalized training specific to all job operations and safety related to staff functions. Clear documentation of training should be referred to and reviewed periodically to ensure that consistent and updated training is provided and to measure safety improvement practices. Performance evaluations performed on each staff member should include references to participation (or lack of same) in training programs.

Facility management staff should document all safety related training that is conducted. These documents should be stored at a designated document center for easy access and reference by both management and employees. Any training the district provides can be videotaped for future reference and training opportunities.

Certainly, there are other tools that can help enhance the ability to retain staff. Recognition, inclusion and development of trust are all tools with low cost, but help build loyalty in ways that compensation alone cannot achieve. The district should evaluate and implement such opportunities as may be appropriate to their situation at the time.

As best practices show that 2-5% of a facility department's overall personnel budget should be spent on training and development, based on 5% of their personnel budget, BISD should spend approximately $31,333 annually on training for their Maintenance Department.

DESIGN GUIDELINES

Finding #3 – BISD has no design guidelines to steer the design of future upgrades or construction projects. Any guidelines that may have evolved during current design processes are not expected to survive the completion of current projects, since they are not documented except in project notes.

Recommendation #3: Develop a set of design guidelines that will steer the design activities of future design teams on future projects. Design guidelines can help provide consistent standards in materials used as well as aesthetics, and reduce the amount of last minute decision-making that frequently occurs on construction and remodeling projects. Providing a set of guidelines that define expectations by the owner can help avoid disappointments such as not receiving all the desired security features in projects currently in process. They can also help guide decision-making on the part of maintenance personnel.

With a new facility coming on line soon, district leadership has an ideal opportunity to establish additional sets of standards, guidelines, goals and objectives guiding activities impacting building condition and appearance with input from a wide variety of stakeholders, including building occupants and non-instructional staff.

The standards should identify formalized processes for the following:

- master planning;
- school design and performance guidelines;
- design guidelines;
- value engineering and post-occupancy reviews;
- maintainability reviews during design phases;
- commissioning;
- facilities documentation exchange and control;
- facilities management information standards;
- capital needs assessment;
- preventive maintenance programs; and
- facilities performance measurement (key performance indicators).

No design guidelines existed prior to Parkhill arriving on-site as they prepared to design the new school and the other capital projects. One reason offered for this situation is that the district had not previously had a need for those guidelines, since there had been little new construction in recent decades. That same risk survives into the future.

Depending on the source of information one chooses to consider, maintenance staff was either not invited to participate in the identification of design guidelines for the current projects, or minimally involved. During the construction project, design decisions are made when the need arises, frequently by the superintendent. While this will likely result in a facility that is pleasing to the current administration, it may not be consistent with best practices in facilities operations and maintenance. There is no guarantee that a standard specification will survive these projects, or that they match specifications for other similar products or systems already in place in the district.

The district should identify a set of design guidelines that address the architectural vocabulary of the facilities to be built henceforth. As much as possible, the guidelines should identify detailed specifications for certain products and systems, without violating the intent of procurement regulations. Life cycle costing or "total cost of ownership" considerations should play a role as product specifications are identified. The district should solicit input from all stakeholder groups having a long-term interest in the district's facilities, with attention being paid to design preferences (beyond code requirements) related to the safety and security of staff and students. This set of guidelines should be captured in a format that can be updated and shared.

These guidelines should guide both the design and construction of new capital projects or upgrades, as well as decisions made by maintenance personnel as they maintain, upgrade or replace existing products and systems. The district will have to exercise care to differentiate between "must have" and "would be nice to have."

Producing a document that is readily available and whose contents can receive frequent reviews and updates will help avoid conflict and misunderstanding later. Designers, users, and the people in the facilities organization will all have an understanding of priorities and needs ahead of time. They may not agree but will be informed.

PROJECT COMMUNICATIONS

Finding #4 – Members of the facilities maintenance staff had minimal opportunity to provide input into the design processes associated with current projects, nor in reaching any of the "value engineering" decisions subsequently made by district officials.

Recommendation #4: Establish a project communication process soliciting input from parties impacted by the design characteristics of a project, supported by a two-way communication link with the designers. It is important that stakeholders, including facilities staff as well as educators and other administrators with an interest in a project, have the opportunity to provide constructive input and receive corresponding feedback during the design phases of a project, before it enters into the construction phase. This will frequently result in a better project, often decreasing the number of change orders during construction, and creating cost avoidance after acceptance of the project.

Even with the existence of carefully developed design guidelines, questions and issues will arise during the design process—even as it morphs into the construction phase. Accusations materialize among maintenance staff that "no one asks us for our opinion" while project managers and district administrators claim that staff did not take advantage of the opportunity to review drawings in the early stages, and/or did not submit comments. Even as the current construction project on the new elementary school is approaching completion, maintenance staff is already commenting that the facility includes features that they will have difficulty supporting in the future.

While this type of conflict may not be completely eliminated, it can be mitigated. The district should establish a formal process requiring maintenance staff and supervisors to review drawings as they evolve through schematics and design development before the designers move to the development of construction documents. Comments, suggestions, and questions regarding design elements should be submitted in writing, bearing the reviewer's signature. After careful evaluation by designers and district administrators, the person offering the comments should receive written feedback regarding the dispensation of the comment(s), and the reasons behind that decision. The successful implementation of this type of protocol has the potential of enhancing trust, with the likelihood of delivering a better product that will outlast its projected lifetime.

PREVENTIVE MAINTENANCE PROGRAM

Finding #5 – The maintenance staff is almost exclusively in a "response mode" as they react to complaints or reports from school staff. Except for the replacement of filters, and some summertime inspections, there is minimal investment in any type of preventive maintenance program.

Recommendation #5: Develop a work scheduling philosophy based on a more aggressive preventive maintenance concept and clearly articulated standards. Currently, the support staff performs a wide variety of duties, partially because they are often in a mode of "putting out fires." This is expensive and inefficient use of their talents and time. Some of their tasks could be more efficiently performed by generalists. Having clearly identified standards in place and expectations defined can lead to improved productivity and enhanced functioning of buildings and critical systems.

A primary objective for BISD should be the development of an effective preventive maintenance (PM) system. Currently, the function that comes close to fitting this description is the routine replacement of filters associated with the many rooftop HVAC units owned by the district. This function is performed by a part-time employee.

Professional standards suggest that each of these units should receive a certain amount of preventive maintenance servicing during the course of each year. Without a detailed inventory, it is not possible to project with any accuracy the total time investment associated with such a requirement. An educated guess suggests a requirement of less than 100 hours total per year for the units currently in use. This figure does not include associated travel time.

Additionally, the district should insist on PM activities on its electrical distribution panels. This should require less than 0.5 hour per panel. Routine inspections should also be performed on roofing systems. These are largely visual in nature.

An effective preventive maintenance system can help ensure acceptable life expectancies of critical systems. It can also help provide a safer, more reliable learning environment, and decrease the potential of subsequent losses of other assets or unacceptable interruptions of certain functions.

BISD's maintenance program is insufficient to assure the long-term stewardship required to preserve the district's assets. BISD's maintenance program consists of corrective actions, occasional facility inspections and filter replacements. There was little evidence of preventive maintenance being performed on equipment beyond that described above. There is no historical documentation of the work performed. The continued absence of a formalized maintenance program will result in inordinate expenditures and a truncated useful life.

With few exceptions, preventive maintenance has been considered the most effective way of maintaining building systems and extending the service life of equipment. Most PM programs are based on the assumption that there is a cause and effect relationship between scheduled maintenance and system reliability. The primary assumption is that mechanical parts wear out, thus the reliability of the equipment must be in direct proportion to its operating age.

Research has indicated that operating age has little or no effect on failure rates. There are many different equipment failure modes, only a small number of which are actually age or use related. Reliability Centered Maintenance (RCM) was developed to include the optimal mix of reactive-, time- or interval-based, and condition-based maintenance.

RCM is a maintenance process that identifies the most cost effective actions that will reduce the probability of unanticipated equipment failure. The principle is that the most critical facilities assets receive maintenance first, based on their criticality to the mission of the facility or organization dependent on that asset. Maintainable facilities assets that are not critical to the mission are placed in a deferred or "run to

failure" maintenance category, and repaired or replaced only when time permits or after problems are discovered or actual failure occurs.

A streamlined RCM maintenance process allows organizations to use their scarce personnel and funding resources to support the most critical assets, the failure of which will potentially have the highest impact on the organization's mission.

Streamlined RCM programs have several clear benefits:

- Managers, not equipment, plan shop technicians' activities and time.
- Planning of work allows labor, parts, materials and tools to be available when needed.
- Equipment part replacements are minimized. The probability that bearings need only lubrication and not replacement is maximized. PM also minimizes the potential need to not only replace bearings, but also the shaft, rotating parts, bearing housings, casings, and possibly motors.
- Managers/schedulers have time to evaluate what other work could be done at the same time and location as the planned PM, optimizing shop productivity.
- Engineers can study equipment maintenance histories to implement changes that could improve equipment performance or energy efficiency.

The following sections further define the various aspects of a streamlined RCM program.

Passive Monitoring: Passive monitoring (e.g., corrective, reactive, or breakdown maintenance), does have a place in facility operations, but should be limited to equipment that has been evaluated to have no risk of business interruptions or consequences of direct or indirect damage to facilities. "Run-to-failure" plans can be cost effective where the cost of PM over the life cycle of the equipment is greater than the loaded cost of equipment replacement.

Preventive Maintenance: Preventive Maintenance is interval-based work that is planned and scheduled to allow maximum efficiency, minimize excessive labor and parts replacement and prolong the useful service life of equipment. A comprehensive PM program allows the building systems to operate at full efficiency for their useful life and can prevent expensive repairs due to equipment failure. PM programs are also required to preserve most equipment warranties. PM is deemed appropriate for equipment where abrasive, erosive, or corrosive wear takes place, or material properties change due to fatigue.

Preventive Maintenance should be scheduled to be performed at specific frequencies and completed at times in the aging process of the equipment where it can be restored with minimal investment. This proactive approach through such tasks as filter replacements, belt tightening/changes, cleaning, etc., ensures that the equipment ages as slowly as possible.

Predictive Maintenance (also referred to as condition-based maintenance or predictive testing and inspection – PT&I): Predictive testing and inspection (PT&I) should be implemented as a part of the overall RCM program. Equipment operating conditions should be monitored during the PT&I inspections and trends developed to help determine the need for additional PM and the optimum time for equipment overhaul or replacement.

The best use of PT&I is to implement simple visual/audible and non-destructive procedures (e.g., temperature and pressure readings) to record conditions at a specific time (snap shot) when the equipment is inspected at the time of PM. When a series of condition records (snap shots) is compiled, a trend analysis can be developed. This trend analysis is the basis of PT&I and can provide factual data to support capital expenditure decisions regarding building systems.

Specific PT&I methods that have proven to be effective are listed herein:

- Airborne Ultrasonic Testing – Most rotating equipment and many fluid system conditions will emit sound patterns in the ultrasonic frequency spectrum. Changes in these ultrasonic wave emissions are reflective of equipment condition. Ultrasonic detectors can be used to identify problems related to component wear as well as fluid leaks, vacuum leaks, and steam trap failures.
- Infrared Thermography – Infrared (IR) thermography can be defined as the process of generating visual images that represent variations in IR radiance of surfaces of objects. IR tries to detect the presence of conditions or stressors that act to decrease a component's useful or design life. Many of these conditions result in changes to a component's temperature that can be detected with IR.
- Motor Circuit Evaluator (MCE) Testing – MCE is used during acceptance to evaluate the condition of motor power circuits. Any impedance imbalances in a motor will result in a voltage imbalance. Voltage imbalances in turn will result in higher operating current and temperatures, which will weaken the insulation and shorten the motor's life.
- Vibration Analyses (Rotating Equipment) – Equipment which contains moving parts vibrates at a variety of

frequencies. These frequencies are governed by the nature of the vibration sources, and can vary across a wide range or spectrum. If any of these components start to fail, its vibration characteristics change, and vibration analysis is about detecting and analyzing these changes.

- Lubrication Oil Analyses – Oil analysis (OA) is the sampling and laboratory analysis of a lubricant's properties, suspended contaminants, and anti-wear additives. OA is performed during routine preventive maintenance to provide meaningful and accurate information on lubricant and machine condition. By monitoring oil analysis sample results over the life of a particular machine, trends can be established which can help eliminate costly repairs.
- Water Chemistry Analysis – The use of chemistry to determine the chemical make-up of water used in hydraulic systems to help identify existing or future problems. This analysis should include pH, conductivity, Phenolphthalein and Methyl Purple alkalinity, hardness, iron (and any metals specific to the system), Sulfate, Nitrate and Ammonia.

To develop a comprehensive maintenance program, the district should begin by identifying systems and components, prioritizing maintenance activities, developing job plans, and estimating job plan completion times. Each activity is further defined below:

Step 1: Identification of Systems and Components – Any comprehensive maintenance program begins with a facilities assessment to identify the various assets' systems and components. All pertinent information should be collected (e.g., manufacturer, serial #, model #, capacity, size, etc.), and a determination of the present condition made to establish a baseline from which to work. Knowing the age and condition of equipment is a prerequisite for maintaining it properly.

Step 2: Prioritizing Maintenance Activities – Equipment to be included in the maintenance program should be selected based on the cost of performing advanced maintenance weighted against the cost impact of deferring the maintenance.

Information should be obtained during the data collection process to associate a priority with each system and asset in each of the district's facilities. Criticality of each asset should be determined through a review of the system's function, area served, and importance of reliability. The criticality assessment provides the means for quantifying the importance of each system and its components relative to the identified mission. A numerical ranking of one through ten can be adopted and applied (**Exhibit 3**). The equipment can subsequently receive a priority ranking based on its criticality of maintaining functionality of the facilities or other predetermined district mission needs. Prioritization becomes increasingly important as available resources become scarce.

Step 3: Developing Job Plan & Estimating Completion Times – Once the analysis is complete and the appropriate maintenance methods established for each type of equipment and by location, maintenance tasks for all equipment types should be compiled.

Maintenance tasks should be based on manufacturer's recommendations and/or job plans developed by industry standard publications, such as R.S. Means, U.S. General Services Administration, and Whitestone, and adapted based on experience. Detailed tasks, performance times, and frequencies by equipment type should be developed. Care should be taken to format the tasks in a mean and method for future uploading into a CMMS system.

In addition to specific tasks, standard performance times and frequencies, the job plans should also describe a process for resolving maintenance problems and the specific tools and materials needed. Some problems will be simple and the appropriate corrective action can be included among the other information in the task list. Other problems may not have an obvious solution, and in these cases the responsibility and process for addressing the problems should be clear.

Once a comprehensive list of maintenance tasks is developed, it may be necessary to again look at the prioritization of items or adjust the frequency of tasks to fit staff availability. Because resources are finite, maintenance planners will need to use some judgment to identify the tasks that are most important, to get "the biggest bang for the buck." When setting these priorities it is important to keep in mind the criticality rankings previously determined, so as to not overlook and reduce maintenance on mission critical systems.

The district is fortunate to already have on its staff several individuals who are skilled in the various trades commonly relied upon in the application of a comprehensive maintenance program. The challenge is to adjust their current workload so that they gain time and opportunity to perform the functions associated with a PM program. This will require that some of the more menial or routine tasks, including set-ups and special events, be performed by "generalists," of which the district has several on its personnel roster. Since the current staff already has a full workload, this may require the hiring of an additional generalist. Based on current wages paid by the district to individuals generally falling into that classification, this may require an increase in the district's personal services budget of approximately $18,195/yr. This adjustment in staff and skill levels will only become necessary

EXHIBIT 3
BISD CRITICALITY ASSESSMENT RANKING
MAY 2008

RANKING	EFFECT	COMMENT
1	None	No reason to expect failure to have any effect on safety, health, environment, or mission.
2	Very Low	Minor disruption to facility function. Repair to failure can be accomplished during trouble call.
3	Low	Minor disruption to facility function. Repair to failure may be longer than trouble call but does not delay mission.
4	Low to Moderate	Moderate disruption to facility function. Some portion of the mission may need to be reworked or process delayed.
5	Moderate	Moderate disruption to facility function. 100% of the mission may need to be reworked or process delayed.
6	Moderate to High	Moderate disruption to facility function. Some portion of the mission is lost. Moderate delay in restoring function.
7	High	High disruption to facility function. Some portion of the mission is lost. Significant delay in restoring function.
8	Very High	High disruption to facility function. All of mission is lost. Significant delay in restoring function.
9	Hazard	Potential safety, health, or environmental issue. Failure may occur with warning.
10	Hazard	Potential safety, health, or environmental issue. Failure will occur without warning.

SOURCE: National Aeronautics and Space Administration, Reliability Centered Maintenance Guide for Facilities and Collateral Equipment, February 2000.

after the essence of a maintenance program has been established.

The fiscal impact of creating a comprehensive maintenance program is limited to the internal allocation of resources to inventory and set up the job plans, and the purchase of industry standard job plans if the district does not already have access to these resources.

If internal resources are unable to accomplish this task, additional resources (i.e. consultants) could be hired to aid in the data collection and program set up. Outside consultants could typically be procured for $.05/square foot to aide in the data collection and program setup. $.05/ square foot times the District's total square footage (500,000 square feet) equates to approximately $25,000.

Computerized Maintenance Management Systems (CMMS) are available that focus on such maintenance programs for school districts of all sizes. These systems will not only help schedule services on equipment, they can also track costs and activities associated with each asset entered into the system. The right system will help management identify the particular skills they need at various times of the year, allowing them to manage and balance workloads.

Currently, the district is not in possession of any documented facility and maintenance performance standards that can be shared with support staff, teachers, or administrators. Decisions regarding frequency of service, response times, and staffing levels are thus routinely based on perceptions and perspectives. No information is available to determine the cost of most maintenance functions, either at the system or component level or for an entire building. The district aggregates actual costs for all buildings into single expense category line items inclusive of all buildings, whereas annual budgets are prepared and submitted for individual buildings.

PERFORMANCE STANDARDS

Finding #6 – There is consensus that the composite condition of the school facilities is only "average."

Recommendation #6: Develop a set of building condition and appearance standards. BISD leadership has an opportunity to establish goals and objectives for building condition and appearance, with substantial input from building occupants as well as non-instructional staff. This set of standards can then be monitored and measured across all facilities in the district.

Currently, the district employs six individuals having the responsibility for maintenance of all facilities. According to a survey of school districts completed by *American School and University* (2008), the median number of square feet per maintenance employee is approximately 107,439 square feet. BISD's maintenance staffing level appears to be consistent with that finding.

BISD should consider identifying the levels of service appropriate for the district's facilities and assets. The

Association of Higher Education Facilities Officers (APPA) has published Service Level Guides that provide a benchmark standard for service and performance (APPA, 2002). This standard is used extensively in the public sector as a guide for comparing facility condition with the level of effort needed to maintain a desired level of service, as shown by **Exhibit 4**. A modified approach to this measure is often more useful because it allows customers to determine the desired service level for a given facility and then match expenditures and level of effort to the desired outcome. This approach recognizes that not all facilities need to be maintained to the highest level. It allows the maintenance leadership to evaluate its portfolio and assign variable service levels as customer needs, capital funds availability and operating budgets dictate.

The optimal level of service for a curriculum based facility should be a Level 2 - *Comprehensive Stewardship* **(Exhibit 4**). Results of custodial services and special requests indicate that district personnel are able to achieve Level 2. It should be noted that the levels of service relating to building maintenance and operations at BISD, as shown bolded in **Exhibit 4,** are mostly classified as **Level 3** and **Level 4**. As reported in other sections of this report, BISD does not maintain comprehensive work records to verify all information; therefore, the exhibit is based on information gathered through visual observations and interviews. Thus, although the district rates itself at a Level 2 in the category **Building Systems' Reliability**, visual inspections by the review team were not able to validate that position.

As stewards of facilities, districts have to accept that they will have to make expectations align with financial resources. This may also mean that the district does not have to identify a single level of service for all of the criteria. Frequently, school districts spend a great deal of attention to the physical appearance of public spaces, while indicating less concern about system reliability or preventive maintenance. Priorities

EXHIBIT 4
BISD CURRENT LEVEL OF SERVICE
MAY 2008

LEVEL	1	2	3	4	5
DESCRIPTION	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
Customer Service & Response Time	Able to respond to virtually any type of service, immediate response.	**Response to most service needs, including non-maintenance activities, is typically in a week or less.**	Services available only by reducing maintenance, with response times of one month or less.	Services available only by reducing maintenance, with response times of one year or less.	Services not available unless directed from top administration, none provided except emergencies.
Customer Satisfaction	Proud of facilities, have a high level of trust for the facilities organization.	**Satisfied with facilities related services, usually complimentary of facilities staff.**	Accustomed to basic level of facilities care. Generally able to perform mission duties. Lack of pride in physical environment.	Generally critical of cost, responsiveness, and quality of facilities services.	Consistent customer ridicule, mistrust of facilities services.
Preventive Maintenance	All recommend preventive maintenance (PM) is scheduled and performed on time.	A well-developed PM program. Occasional emergencies.	Reactive maintenance predominates due to systems failing to perform.	**Limited PM program.**	No PM performed.
Maintenance Mix	All recommend preventive maintenance (PM) is scheduled and performed on time. Emergencies (e.g. storms or power outages) are very infrequent and are handled efficiently.	A well-developed PM program: most required PM is done at a frequency slightly less than per defined schedule. Occasional emergencies caused by pump failures, cooling system failures, etc.	Reactive maintenance predominates due to systems failing to perform, especially during harsh seasonal peaks. The high number of emergencies causes reports to upper administration.	**Worn-out systems require staff to be scheduled to react to systems that are performing poorly or not at all. PM work possible consists of simple tasks and is done inconsistently.**	No PM performed due to more pressing problems. Reactive maintenance is a necessity due to worn-out systems. Good emergency response because of skills gained in reacting to frequent system failures.

EXHIBIT 4 (CONTINUED)
BISD CURRENT LEVEL OF SERVICE
MAY 2008

LEVEL	1	2	3	4	5
DESCRIPTION	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
Aesthetics, Interior	Like-new finishes.	**Clean/crisp finishes.**	Average finishes.	Dingy finishes.	Neglected finishes.
Aesthetics, Exterior	Windows, doors, trim, exterior walls are like new.	**Watertight, good appearance of exterior cleaners.**	Minor leaks and blemishes, average exterior appearance.	Somewhat drafty and leaky, rough-looking exterior, extra painting necessary.	Inoperable windows, leaky windows, unpainted, cracked panes, significant air & water penetration, poor appearance overall.
Aesthetics, Lighting	Bright and clean, attractive lighting.	**Bright and clean, attractive lighting.**	Small percentage of lights out, generally well lit and clean.	Numerous lights out, some missing diffusers, secondary areas dark.	Dark, lots of shadows, bulbs and diffusers missing, cave-like, damaged, missing hardware.
Service Efficiency	Maintenance activities appear highly organized and focused. Service and maintenance calls are responded to immediately.	Maintenance activities appear organized with direction. Service and maintenance calls are responded to in a timely manner.	**Maintenance activities appear to be somewhat organized, but remain people-dependant. Service and maintenance calls are variable and sporadic, without apparent cause.**	Maintenance activities appear somewhat chaotic and are people-dependant. Service and maintenance call are typically not responded to in a timely manner.	Maintenance activities appear chaotic and without direction. Equipment & building components are routinely broken and inoperable. Service & Maintenance calls are never responded to in a timely manner.
Building Systems' Reliability	Breakdown maintenance is rare and limited to vandalism and abuse repairs.	**Breakdown maintenance is limited to system components short of mean time between failures (MTBF).**	Building and systems components periodically or often fail.	Many systems are unreliable. Constant need for repair. Backlog of repair exceeds resources.	Many systems are non-functional. Repair instituted only for life safety issues.

SOURCE: Maintenance Staffing Guidelines for Educational Facilities, The Association of Higher Education Facilities Officers, 2002.

established at one school district may not match the desires of stakeholders at another.

Once the target level has been identified and accepted by a majority of the constituents, the district can move toward establishing staffing levels and skills to achieve that desired level of service.

As suggested in Recommendation #2, the appropriate skill levels appear to be represented among existing staff in the facilities organization. A re-alignment of assignments and work efforts may help achieve a shift to a level higher than current exists, especially if the district is able to fund an additional "generalist" position, freeing up the skilled craftsperson's time to perform other tasks.

Currently, the district is not in possession of any documented maintenance performance standards that can be shared with support staff, teachers, or administrators. Decisions regarding frequency of service, response times, and staffing levels are thus routinely based on perceptions and perspectives. No information is available to determine the cost of most maintenance functions, either at the system or component level or for an entire building. The district's financial officer aggregates actual costs for all buildings into single expense category line items inclusive of all buildings, whereas annual budgets are prepared and submitted for individual buildings.

District administrators, with tools provided by a CMMS and with input from various stakeholder groups, should identify

maintenance performance standards for most functions in the facilities support area. They should share those standards with building occupants. They should identify KPIs (key performance indicators) that measure staff's effectiveness in satisfying those standards. Having this level of knowledge will help identify organizational or operational adjustments that will improve performance and clarify expectations.

Key performance indicators will also allow the district to establish benchmarks. Such indicators, if correctly established, will enable the district to compare its performance against itself, as well as against those of other comparable districts. One key performance indicator (KPI) that is widely used is the O&M cost per square foot.

The district does not have enough information readily available about its own performance to determine if its resources are applied in the best possible manner, to know it is "doing the *right* things right," and at the right locations. It is also possible that an undetermined amount of "maintenance money" is being applied to the completion of projects and other services. As a result, BISD is unable to compare itself to other, peer school districts.

The district may also want to consider a slight change in staffing philosophy. Currently, the staff directly responsible for BISD facilities are all dedicated individuals whose orientation is primarily "hands-on." Their district level supervisor, also dedicated, comes from a strong academic background. There appears to be no one on staff who has a background or training in strategic leadership of a facilities organization. Therefore, strategic planning from a facilities perspective is not happening to the extent it should be in today's environment. It may thus be appropriate for the district to consider redefining a position that becomes vacant at some point in the future such that it can recruit an individual who is or can become well-versed and experienced in strategic facilities management.

To keep up with today's facilities demands, the role of Maintenance Director has to progress from the role of "halls, walls, mops, and cops manager" to that of developing, directing, organizing and administering the planning of the facility functions while effectively managing personnel.

The new Maintenance Director will need to have the right balance of strategic and tactical skills to accomplish the various facility functions needed in a progressive facilities organization. Strategic activities identify the "what" and "why" of the organization and include:

- strategic facilities planning;
- capital project development;
- organizational development;
- policy and standards development; and
- marketing the department and its services.

Tactical activities address the "how;" they are the specific tasks needed to implement a strategy. Tactical activities include:

- construction;
- renovation;
- space planning;
- workplace planning, allocation, and management;
- operations, maintenance and repair;
- telecommunications; and
- general administrative services.

Because so much of the work in facilities is tactical in nature it is often difficult to set aside time for strategic planning. The Maintenance Director needs to be both a visionary and a doer so that the maintenance department not only "does the right thing" but "does the right thing right."

Districts such as BISD have limited budgets. It may thus be prudent to hire someone who has the potential to grow into these attributes and find them future training opportunities to help them progress. It should be noted that hands on tactical skills are still imperative where limited resources exist; however, finding an individual with these skills who is also energetic about strategy and progression is imperative to the district's forward progress. This role assigned to this individual could be classified as a "director of facilities management," although another title consistent with the district's Human Resources policies or guidelines could certainly be appropriate.

If the district is inclined and has the opportunity to include a Facilities Director on its management team, one of that person's first challenges should be to develop a *strategic facilities plan*. A well-developed plan helps to establish clear parameters for action and ensures that activities are consistent with the district direction. It should include the following components, as identified by David G. Cotts in his book *The Facility Management Handbook, Second Edition (1997)*:

- Mission statement: The facilities mission statement should be derived from the district mission statement, goals, and objectives.
- Goals and objectives: Goals are quantitative statements and objectives are measurable tasks.
- Trend analysis: The facilities plan should also describe those external factors that are likely to affect facilities. External events may include environmental regulations,

rising furniture costs, utility deregulation; they also include changes in the corporation (district) that are likely to affect facilities.

- Key variables: These are factors that will affect the success of the different facilities function initiatives. Key variables may include monetary resources or additional staff.
- Strategic alternatives: This section of the plan can also be called "scenario planning" as it involves developing scenarios of probable events. The scenarios should represent the worst case, best case, and most probable case.
- Final Strategy: Based on the strategic alternatives generated and an analysis of industry data, a final strategy should be recommended. In terms of criteria for selecting one of several alternatives, the district should evaluate available resources, degree of risk, timeline, and practicality.

PROCEDURE FOR REPORTING PROBLEMS

Finding #7 – There is no clearly defined protocol for filing trouble reports with the maintenance staff.

Recommendation #7: Design and implement a consistently applied request protocol for the various types of needs that individuals in the schools might experience. Having a clearly defined and widely shared process will help reduce the number of reports that may currently fall through the cracks, while helping maintenance staff schedule their workload.

There is no consistent understanding among building users regarding the process to be followed to report a problem, or to request a service. Some individuals believe that they only have to tell the head-custodian about issues. Others go to the school secretary, who may either tell the custodian or call the district office. Still others may know the responsible technician, and make direct contact.

Confusion exists among the non-instructional staff regarding how to respond to certain types of requests. This situation makes tracking of requests difficult, and allows the potential for requests to fall through the cracks. It complicates supervisors' ability to manage work schedules for their employees. Not least, it further muddies the water regarding the tracking or reporting of costs associated with activities.

The district should strive to identify and insist on the use of a protocol that facilitates the reporting of issues by building occupants, tracks those reports, and allows managers and supervisors to manage their staff and their budgets. Such a protocol should provide, as much as possible:

- a single point of contact, regardless of the type of request or report;
- how to make that contact (phone, e-mail, other);
- names or titles of individual(s) whose authorization may be required for certain types of requests; and
- names or titles of individuals authorized to make such requests.

The protocol should clarify the process to be followed for initial follow-up or investigation, performance of work, and closure. It should also identify opportunities for "customer feedback," consistent with the nature of the request. The protocol may be suggested by the characteristics of the selected CMMS, which may come with its own set of optional business rules.

FACILITY MANAGEMENT INFORMATION TECHNOLOGY

Finding #8 – There is an absence of facility management information technology, such as an automated work management system. This makes it difficult to track performance and obtain good data to make decisions based on factual and retrievable data.

Recommendation #8: Implement facility management information technology in the form of an automated work order management system (computerized maintenance management system – CMMS).

BISD is not in possession of any facility management information technology to automate and manage work processes. This limits their ability to track asset and resource performance and to make informed decisions based on credible data. There is an attempt to track some of the activities on a local Personal Computer (PC), but the information flow stops there. Facility management information technology at BISD is currently limited to an informal and inconsistent trail of work requests. Maintenance personnel are dispatched by the maintenance supervisor either by handing off a note, or by contacting them using cell phones or two way radios. There is no feedback mechanism available to the supervisor after work has been completed, therefore thwarting the ability to track performance and make informed decisions.

There are two general categories of facility management information technology: Computerized Maintenance Management Systems (CMMS) and Computer-Aided Facility Management (CAFM) systems. Basically, both CMMS and CAFM systems handle work management processes, with CAFM systems having additional space management capabilities. CMMS are more efficient at channeling requests through their life-cycle when compared

to paper-based tracking tools. CMMS systems have become more affordable and easy to use. Their purpose is to manage work requests as efficiently as possible while providing the basic information needed to make informed and timely decisions. The benefits of automation continue to increase and include:

- better management solutions;
- increased efficiency;
- the ability to track asset/equipment histories;
- organized Facilities Management data and information;
- expedited decision-making;
- improved maintenance quality/labor tracking;
- improved communication;
- reduced operating costs; and
- better use of facility space.

Many CMMS software packages offer bells and whistles that are not needed for accomplishing the primary mission of implementation. In fact they often complicate the systems configuration and interface, rendering it laborious to use and maintain. The Planning Guide for Maintaining School Facilities published in 2003 by the U.S. Department of Education offers helpful guidelines for evaluating the ever growing number of CMMS software packages on the market:

1. The CMMS should be network- or Web-based, be compatible with standard operating systems, have add-on modules, and be able to track assets and key systems. Source codes must be accessible so that authorized district staff are able to customize the system to fit their needs as necessary. In terms of utility, a good CMMS program will:
   - *Acknowledge the receipt of a work order;*
   - *Allow the Maintenance Department to establish work priorities;*
   - *Allow the requesting party to track work order progress through completion;*
   - *Allow the requesting party to provide feedback on the quality and timeliness of work;*
   - *Allow preventive maintenance work orders to be included; and*
   - *Allow labor and parts costs to be captured on a per-building basis (or, even better, on a per task basis).*

2. *At a minimum, work order systems should account for:*
   - *The date the request was received;*
   - *The date the request was approved;*
   - *A job tracking number;*
   - *Job status (received, assigned, ongoing, or completed);*
   - *Job priority (emergency, routine, or preventive);*
   - *Job location (where, specifically, is the work to be performed);*
   - *Entry user (the person requesting the work);*
   - *Supervisor and craftsperson assigned to the job;*
   - *Supply and labor costs for the job; and*
   - *Job completion date/time.*

Implementation of an automated work order system requires careful forethought and development of data standards to ensure long-term usability of the system. Many computerized maintenance management (CMMS) and computer-aided facility management (CAFM) systems fail because the data is not standardized and maintainable. Proper implementation and the use of data standards will lead to valuable and effective information and work management systems.

Any automated system is only a tool to support business processes. It is therefore necessary for the district to be able to document its work processes prior to implementing technology. Subsequently, staff needs to identify and establish a specific set of data standards. This will become the framework for data management.

Most often, Construction Specifications Institute (CSI) UniFormat or Omniclass standards are used for creating building information models. These standards provide guidance on defining naming conventions and parameters such as buildings, building systems, equipment, components, work processes, and attributes. Use and enforcement of these standards increases the quality of the data, optimizes the system performance, and enables better reporting.

Developing a strategic technology plan will provide the long-term focus needed to successfully select and implement a system and ensure that it supports facilities business processes. The most successful CMMS implementations are those where the facility manager had a sound strategic technology plan, automated broadly, emphasized training, did not try to over-populate, had good internal electronic communications in place, had a dedicated automation manager, had buy-in from top to bottom, understood all costs, and maintained good administrative procedures.

The critical success factors in creating a strategic technology plan include the answers to the following questions:

- Who needs to participate on the planning team?
- Who needs to commit to the objectives of the plan?
- What are the roles of vendors and consultants in preparing a plan?
- What are the predictable do's and don'ts?
- What should be included in the plan?
- Have we set up implementation expectations in the strategic plan?

In order to start this type of project off right, the district needs to assemble a formal Technology Advisory Team (TAT). The team should consist of an integrated team of facility representatives from the district. Each individual on the Team has an opportunity to provide input regarding his/her specific area of expertise or requirements of the selected system. The TAT will be responsible for designating an interested, motivated and talented Champion to lead them. To be successful the TAT must be empowered, authoritative, consistent, diversely representative, interested, and knowledgeable. The TAT is responsible for overseeing implementation and optimization, data integrity and application stewardship, adjudicating resource allocation, and evaluating and recommending future needs and requirements. The TAT is responsible for maintaining the integrity of the data and data standards. All members of the Technology Advisory Team must "own" the technology vision. This group is the vehicle responsible for maintaining momentum.

The Technology Advisory Team should include:

- a Maintenance Director;
- Information Technology (IT) Managers;
- Maintenance Supervisors;
- Stockroom/Warehouse Managers;
- Training Program Managers;
- Finance Managers; and
- School Administrators.

The following are issues that the TAT will need to understand:

- Who are the customers?
- Who needs to commit to the objectives of the plan?
- What are the roles of staff, vendors and/or consultants in preparing a plan?
- Have we set up the right expectations in the strategic plan?
- How do we make our Information Technology (IT) work for us?
- How do we gain commitment?
- Is our Facility Management (FM) department IT savvy?
- What are the true costs?
- Who owns the database?
- Who is responsible for standards?

The team that does the planning should also lead the implementation and on-going management of the technology initiative. Typically, the team that selects the strategic goals will be a little smaller than the one that follows through with the implementation. If the team is too big, it becomes unwieldy when trying to decide on goals. While it is not essential for every interested stakeholder to participate on the planning team, it is essential for all of them to commit to the goals and desired outcomes. They will only do so if they know their interests have been taken into account in the decision-making process.

Once established, the team must identify the strategic objectives of the organization and then mirror them with the technology they are trying to implement. A close evaluation of the existing service level should be made to establish a baseline and benchmark the current status of the organization. Next, the district needs to determine its preferred service level (see previous discussions on this topic). Finally, the team must link the organization's technology goals to help achieve the desired service level.

Typical FM technology projects incur problems, such as too much reliance on vendor claims or a sense of urgency that shortcuts methodical implementation. The following list identifies certain steps to help achieve the desired benefits, while maintaining cost control:

- Go through the discipline of identifying detailed functionality from FM technology that will benefit both maintenance customers and staff, while avoiding unnecessary "bells and whistles."
- Emphasize training.
- Understand all costs.
- Ask basic questions about how things are done.
- Test applications; do not just watch demonstrations.
- Try prototypes and get feedback from users.

- Start by fixing small problems to win support.
- Structure the big project so there are payoffs along the way.
- Select best employees for implementation.
- Settle for 80% solutions.
- Agree on realistic goals.

Additionally, avoid:

- over-populating the database;
- setting vague objectives such as "improve productivity;"
- structuring the implementation so as to avoid conflict;
- selecting a technical implementation leader unskilled in negotiation;
- assuming that interviewing users reveals exactly what they need; and
- emphasizing incremental improvement if fundamental change is what is truly required.

Good general procurement practices should ensure acquisition of the appropriate system. However, the following recommendations are offered:

- shortlist two or three vendors;
- visit at least two reference sites, preferably not only at the vendors' offices;
- use a predetermined scorecard for evaluation;
- establish weight evaluation criteria;
- have vendors demo at the district office, where a variety of individuals can be present; and
- provide incentives for value engineering, knowing that "one size does not fit all."

There are many types of CMMS packages readily available on the market today. For a school district of BISD's enrollment size, CMMS packages cost about $7,000 for the initial year (including $2,000 estimated as a one-time expenditure) and about $5,000 for the annual renewal charges thereafter. Such an investment will allow BISD to achieve the objective in this recommendation.

ENERGY CONSERVATION

Finding #9 – BISD is in the early stages of implementing an energy conservation program. Significant opportunities remain for further enhancements to this effort.

Recommendation #9: Identify and implement opportunities for additional energy conservation with methodologies for measurement and verification. The district has made a start at energy conservation, supported by a directive from the superintendent. However, there is currently no way of showing success as a result of these intentions, and numerous other opportunities remain for additional progress. The district also has a wonderful opportunity at this time to build further onto its success with the Leadership in Energy and Environmental Design (LEED) certification of the new elementary school.

Texas H.B. No. 3693, Sec. 44.902, passed on May 23, 2007 states the following:

> *GOAL TO REDUCE CONSUMPTION OF ELECTRIC ENERGY. The board of trustees of a school district shall establish a goal to reduce the school district's annual electric consumption by five percent each state fiscal year for six years beginning September 1, 2007.*

The enactment of H.B. No. 3693 certainly provides encouragement to school districts throughout Texas to become increasingly aggressive in their energy conservation efforts.

Shortly after his arrival at BISD, Superintendent Stephens issued directives guiding energy conservation activities by building occupants. Interviews with personnel associated with the administration of this program indicate that the program is supported by the installation of programmable thermostats in most areas. The new schools will have centralized controls, while still giving occupants a limited amount of flexibility in adjusting temperatures. There is also a relationship with the local utility company in that it provides an incentive for the use of high efficiency air conditioning units.

Unfortunately, existing record-keeping practices at the district do not prove or disprove the effectiveness of this program. Consumption data covering the most recent three-year period suggest that consumption has actually increased. Several individuals believe that changes in space utilization are responsible for the net increase, amplified by the constantly increasing costs of utilities. While this may be true, the current approach for tracking energy use and cost is inadequate in that it cannot substantiate these claims.

The district should consider the implementation of a process that will encourage accurate tracking of energy consumption. Some CMMS applications offer features that facilitate this activity, although this feature is frequently an "add-on" module. There are also separate utility management software systems that can support this initiative.

The person in charge of energy conservation programs should routinely share results with school principals and other key individuals, much like a report card. The review found that, although the intention is there to do so, principals indicate this is not currently a common practice. School-age youth are increasingly interested in energy conservation. Their energies can provide lively and enthusiastic support to any initiative intent on reducing carbon footprints and protecting their environment.

The district should consider establishing a partnership with a respected and certified energy services company (ESCO). A carefully established relationship can result in the implementation of energy conservation measures (ECMs) financed by energy cost avoidance. Some institutions have actually been able to fund the remediation of other deferred maintenance needs in this manner. Most of the respected and reputable ESCOs provide a monitoring and verification service that will validate the district's claims of being in an energy conserving mode. It is not at all unusual for building owners to reduce their energy consumption by at least 20 percent upon the proper selection of ECMs to be implemented. (See www.naesco.org for additional background information on accredited providers.)

The district may also choose to pursue a similar relationship with consulting firms that specialize in behavior modification directed at energy conservation. Based on experiences at other locations, the district could save an additional 20 percent on its energy consumption.

Based on experiences at other institutions and agencies, the district could realize a cost avoidance of up to 40 percent (before debt service obligations). However, for planning purposes, the district may choose to consider a more conservative estimate of approximately 20 percent (after any debt service obligations) resulting from the implementation of both programs, starting off slowly but marked by a steady growth. Based on the district's current expenditures, and on this very conservative estimate of 20 percent, the district should be able to achieve an annual cost avoidance of at least $100,000 per year. However, since the successful implementation of a program such as this (especially one that relies on a change in cultural habits) takes time, any cost avoidance in the first year of implementation will be a smaller percentage. The fiscal impact assumes a cost avoidance of $10,000 during the first year, with a consistent but significant increase every year thereafter until the 5th year.

LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) CERTIFICATION

BISD deserves recognition for its goal to construct its first LEED-certified school building. With the full support of its Board of Trustees, the district's new elementary school hopes to achieve LEED Certified status, and is well on its way to realizing that goal.

This is not a lifetime achievement, however. LEED recognition pertains to the design and construction of the new building only. In order to be able to retain LEED certification, BISD must be able to demonstrate that they have met or exceeded the standards for operation and performance assumed during the design/construction phase. Thus, after five years of occupancy and use (in 2013), the district will have to plan for certification under the requirements of LEED Existing Buildings Operation and Maintenance (EBO&M). This will not be a difficult task if the district implements the appropriate procedures, processes, controls, and measurements, effective on the first day of use. U.S. Green Building Council (USGBC) case studies indicate that LEED-certified buildings do not always operate at a level of energy efficiency that was projected during the design phase. This variance is frequently the result of untrained or uncommitted building operators.

The district will have to maintain good records in energy use and conservation, cleaning products used, documentation of maintenance activities (with heavy emphasis on preventive maintenance on energy-consuming systems), and other factors that indicate successful operation of a LEED-certified facility.

The district should work closely with vendor representatives to help identify the criteria (based on design elements incorporated into the new building) that will apply when the district chooses to recertify under LEED-EB. Although not the recommended course of action, the district could elect to let this certification expire if the investment does not appear to be justified by the reward.

As those requirements become clear, the district needs to ensure the proper training of its existing staff, and establish policies and opportunities that will result in future training of existing and newly hired staff.

ROOFTOP AIR CONDITIONERS

BISD relies almost exclusively on the use of rooftop units for climate conditioning of its occupied spaces. Using this approach typically results in lower first-cost of a project, when contrasted against the cost of a centralized building system. Maintenance personnel tend to prefer this type of system in that they are less complicated to service than are the centralized systems. Conversely, the costs for operating and maintaining such units in combination with their shorter life expectancies support the generally held belief that such an approach is more costly in the long run.

Interviews with individuals at BISD who are responsible for the existing HVAC systems indicate that a substantial reason for the adherence to this design option is related to the minimization of service interruptions to individual areas served. This may be a valid consideration, but should not be considered as a primary driver for this type of investment.

It is common for ISD projects to select the packaged approach, even though the architects and engineers know that the central plant option is the best when considering life cycle costs (easily paying for it long before the building is retired).

Typical benefits of the central plant approach over the packaged unit approach are as follows:

- Central plants are more energy-efficient; thus presenting lower annual operating costs.
- They benefit from lower maintenance costs, since there is less equipment to maintain, plus a central plant is typically located in an easily accessible central location, without consideration of existing weather conditions.
- Central plant equipment has an appreciably longer service life.

There is no general rule guiding decisions on when a central plant should be selected versus packaged equipment. It may vary from location to location and project to project. Certainly, the square footage of the overall school does have an impact on which system should be selected. A school building larger than approximately 87,500 square feet (350 square feet/ton x 250 tons of cooling) should consider a central plant. This is based on the more common minimum size of most efficient chillers, which is approximately 250 tons; although smaller chillers are available.

Unfortunately, first cost is too often the driving factor; this in turn drives the selection of packaged units. They do have some benefits, however. For instance, packaged units do not typically require additional training of a typically minimally educated staff, whereas central plant equipment is usually maintained primarily under a contract with a qualified service company.

There are applications where packaged units are more efficient to operate, even at schools with central plants. For example, it is often best to install packaged units at office areas and corridors which are to be occupied 12 months, instead of the 9 months the rest of the school is typically used. Central plants commonly serve large air-handling units that require complex ductwork which can present challenges with some school designs.

If packaged units are employed, they should at a minimum include connection to a central energy management control system (preferred), or at least programmable thermostats. The latter are not as ideal, as they are difficult to monitor, are at many diverse locations, and prevent override.

An increasing number of school districts are aware of the overall cost benefit of installing geothermal heat pumps. They have proven to pay back in a relatively short period (less than 5 years) compared with other schools that have traditional central plants. BISD has some experience with this type of technology.

Once aware of its options, the district will be able to guide decisions and associated design standards applicable to future projects from a position of knowledge. Any potential cost avoidance or actual savings will only materialize as new structures are erected.

SAFETY COMPLIANCE AND EMERGENCY MANAGEMENT

Finding #10 – In several instances, building occupants inadvertently create conditions that are unsafe and in violation of fire codes. There is also evidence of other code conflicts, such as missing exit signs, which persist without being resolved.

Recommendation #10: Assign the responsibility for safety compliance and emergency management to an individual having the time and skills to perform those important functions. This responsibility currently resides with an individual who already has many unrelated duties. Because of those other job responsibilities and their time requirements, this person's opportunity to design an emergency operations plan, with its corollary responsibilities, may be limited. Similarly, the responsibilities with administering a safety program on behalf of the district may be compromised.

BISD has a well-established relationship with the refineries and chemical plants surrounding the city of Borger. Unfortunate events in other locations around Texas (e.g., Texas City) are likely solidly imprinted in the collective minds of emergency planners as they have remained aware of the dangers involved in the storage of huge amounts of chemicals (including hydrofluoric acid) at both of these types of plants. Communication links are established, with redundancies built-in. The district office has in place a protocol for notification of principals or other key administrators at each of the schools. These, in turn, have practiced emergency procedures appropriate for the type of untoward event that could occur at one of these potential hazard sources.

The district requires regular evacuation drills, familiarizing pupils and educators alike in procedures to be followed once an evacuation is appropriate.

Nonetheless, the district should consider clearly assigning the responsibility for safety compliance to an individual who has the skills, authority, and time to lead emergency planning and training activities. Other than the procedures described above, there is a lack of documented, defined protocols and lines of authority that should be followed during an emergency. This individual could also be charged with the responsibility for inspecting facilities, to identify and cause corrections to safety issues.

For instance, a quick tour of several schools revealed a concerning lack of EXIT signs at certain locations. Overflow storage was often positioned in front of main electrical distribution panels. It also became apparent that none of the public address (PA) systems are tied to emergency backup power systems (such as a battery), nor were they designed to allow teachers to initiate contact. These shortcomings are present in the design of the new elementary school, as well. BISD may wish to evaluate these options for future implementation.

Borger is located in an area where tornadoes occur with some regularity. School shootings and bomb threats occur nationally, and much more frequently than expected. These types of events could be handled much more effectively if responsibilities and authorities were clearly defined prior to an event.

The Federal Emergency Management Agency (FEMA) has outlined protocols it recommends be followed in preparation and in response to an event. Known as the NIMS model (National Incident Management System), these protocols help guide emergency planning and response activities to be followed by institutions such as public schools, municipalities, universities and other types of agencies.

There is occasional use of a private contractor to deal with certain pests inside buildings, primarily mice and ants. The district is fortunate to have two individuals on staff with the appropriate Environmental Protection Agency (EPA) spray applicator permits. The district does not have in place an integrated pest management plan, as recommended by the Texas School Pesticide Law. The district should provide for the establishment of such a management plan.

It is possible that the district does not have the resources, at this time, to create a new position designed to handle these responsibilities. Therefore, the district should consider organizing a work team that, under the leadership of the superintendent, will be responsible for the development of these strategies and their implementation. This team should then establish a strong link to emergency planners at Borger City and Hutchinson County.

EGRESS AND PEOPLE FLOW AT BORGER HIGH SCHOOL

Finding #11 – Borger High School does not offer a logical or safe flow for its occupants, as they have to commute on a timely basis from one class session to the next. This also creates a potentially hazardous situation when it becomes necessary to evacuate in case of an emergency.

Recommendation #11: Authorize a study to identify issues and solutions associated with student flow and egress at the high school, and make its implementation one of the top priorities in the capital projects plan. Some classrooms or other spaces are located in diverse locations with restricted access by the piecemeal configuration of the buildings. Individuals are expected to travel up and down stairs, go outside and back in as they make their way from one location or class session to the next. Some of the existing conditions also make emergency egress a risky endeavor. This collection of conditions should receive attention as the topmost priority after the new elementary school's completion.

BISD has a challenge at its high school. Numerous buildings, constructed at various times in the high school's history, create a situation where some of the buildings are interconnected and where others are separate from the school's main core. This complex array of buildings contains dead-end corridors, and requires access and egress to/from some spaces by passing through other occupied spaces, including a gymnasium. In some instances, pupils have to go down stairs and exit the building to get to an adjoining space in the same physical building. Several teaching spaces with relatively high occupancy only have one sub-code exit. Other similar issues exist.

The size of the high school makes planning for its complete replacement almost a futile exercise, especially considering the financial limitations under which the district operates. The district is doing well by addressing issues one at a time. For instance, some of the issues with dead-end corridors will disappear as yet another structure is attached to an existing wing. This may solve that particular problem, yet concerns remain about the lack of convenience with which students migrate from one class session to the next. A substantial number of other issues will still remain.

There is no easy answer to this problem. Ideally, the district would be able to find funding and real estate allowing for the construction of a new facility replacing all parts of the current campus except for the auditorium. It was recently remodeled and upgraded to a functional facility that should be retained,

if it can still maintain a close physical relationship to a new high school building.

Nonetheless, even though the district and its stakeholders recognize the seriousness and complexity of the problem, current master planning does not attempt to provide resolution. An adjustment in this line of thinking is not only appropriate, but a necessity.

It is recommended that the district engage in discussions and collaborations with state agencies, private sector enterprises, and other potential financial benefactors with the goal of solving this problem, before the situation becomes more complicated with injuries or even fatalities.

FISCAL IMPACT

RECOMMENDATION	2009–10	2010–11	2011–12	2012–13	2013–14	5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
1. Establish a formal process and schedule to perform facilities needs assessments.	$0	$0	$0	$0	$0	$0	($50,279)
2. Evaluate current job descriptions and associated wages and improve training opportunities to improve recruitment and retention of support staff.	($31,333)	($31,333)	($31,333)	($31,333)	($31,333)	($156,665)	$0
3. Develop design guidelines.	$0	$0	$0	$0	$0	$0	$0
4. Establish a project communication process.	$0	$0	$0	$0	$0	$0	$0
5. Develop a work scheduling philosophy.	$0	($18,195)	($18,195)	($18,195)	($18,195)	($72,780)	($25,000)
6. Develop building condition and appearance standards.	$0	$0	$0	$0	$0	$0	$0
7. Design and implement a request protocol.	$0	$0	$0	$0	$0	$0	$0
8. Implement facility management information technology.	($5,000)	($5,000)	($5,000)	($5,000)	($5,000)	($25,000)	($2,000)
9. Identify and implement opportunities for additional energy conservation with methodologies for measurement and verification.	$10,000	$20,000	$30,000	$60,000	$100,000	$220,000	$0
10. Assign safety compliance and emergency management responsibilities.	$0	$0	$0	$0	$0	$0	$0
11. Authorize a study to identify issues and solutions associated with student flow and egress at the high school.	$0	$0	$0	$0	$0	$0	$0
TOTAL	**($26,333)**	**($34,528)**	**($24,528)**	**$5,472**	**$45,472**	**($34,445)**	**($77,279)**

BORGER INDEPENDENT SCHOOL DISTRICT INSTRUCTIONAL FACILITIES ALLOTMENT

BISD undertook a capital improvement plan funded by bonded indebtedness to provide renovations to existing facilities and space to provide educational services for the students. The enrollment of BISD has fluctuated and the property tax values have increased by an average of 3.9 percent. BISD student enrollment declined by 123 students or 4.3 percent from 2003–04 through 2007–08. During the same period, taxable values have grown by $65,375,368 or 15.6%. **Exhibit 5** presents the enrollments and taxable values from 2003–04 through 2007–08.

The capital improvement plan was based on a facilities assessment that examined the buildings and systems supporting it to determine the extent of renovations necessary and whether a new building was warranted. **Exhibit 6** presents the year the building was built and the facility condition index for the building. A facilities condition index value over 75 indicates a strong need to replace the building.

In October 2005, the board adopted a facilities vision statement, a facilities mission statement and facilities goals. The board also appointed a district-wide facilities committee and a board facilities subcommittee. The district engaged an engineering/architectural design firm to perform pre-bond and post bond architectural services. The firm presented several options to the board and community regarding facility improvements with the final presentation resulting in the board calling a bond election for May 2006 (**Exhibit 7**).

The district used a consulting firm to conduct and analyze a scientifically accurate telephone poll to examine voter attitudes and awareness relative to the potential bond election. The voters passed a $39.8 million bond proposition in May 2006 to fund the construction of a new elementary school, purchase buses and renovate existing facilities.

BISD uses the construction manager at risk (CMR) method to construct buildings and complete renovations to existing facilities. The district negotiated a percentage fee for CMR that is 2.75 percent of the construction costs. The district negotiated a fee structure with the architect based on a percentage of the cost of the construction that varies from 6.5 percent to 11.75 percent of the cost, depending on the estimated cost of the project.

The district negotiated a turn-key pricing structure with the financial advisor that also includes the fee for the bond counsel. The fee is approximately 80 basis points (0.80%) of the par amount of the bonds issued. The fee for the issuance of the 2006 bonds was $154,600 based on a par amount of $19,465,000 and the fee for the 2007 bonds was $162,993 based on a par amount of $20,349,996.

Texas school districts have three major funding sources to repay bond funds used for facilities construction: revenues from local taxes, the existing debt allotment (EDA) and the instructional facilities allotment (IFA). Local interest and sinking (I&S) taxes are levied based on the amount required to fund the district's debt service payments after any funding received from EDA or IFA.

The EDA state program provides tax rate equalization for local debt service taxes. By providing a guaranteed yield on I&S taxes levied to pay the principal of and interest on eligible bonds, the program guarantees a specific amount of state and local funds per student for each cent of tax effort per $100 of assessed valuation. The guaranteed yield for EDA provides $35 per student in average daily attendance (ADA) per penny of tax effort. The EDA state program operates without applications, has no award cycles and is available only to repay bonded debt. The EDA program is available to all districts and is not awarded based on the property wealth per student of the district. It is also intended to help fund debt related to both instructional and non-instructional facilities.

The IFA state program provides assistance to school districts in making debt service payments on qualifying bonds or lease-purchase agreements. Bond or lease-purchase proceeds

EXHIBIT 5
BISD ENROLLMENTS AND TAXABLE VALUES
2003-04 THROUGH 2007-08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	2007–08
Enrollment	2,882	2,800	2,911	2,875	2,759
Taxable Value	$419,406,805	$425,790,655	$437,409,173	$457,322,036	$484,782,173

SOURCE: Texas Education Agency, CPTD Tax Final and Student Enrollment, 2003–04 through 2006–07 and State Comptrollers Office, School and Appraisal Districts Property Value Study 2007, July 2008.

EXHIBIT 6
BISD BUILDINGS AGE AND CONDITION INDEX
2005

BUILDING	YEAR BUILT	FACILITY CONDITION INDEX
Borger High School	1946	59
Borger Middle School	1959	33
Crockett Elementary School	1958	76
Gateway Elementary School	1950	84
Paul Belton Early Childhood Center	1956	51

SOURCE: BISD, Superintendent, May 2008.

EXHIBIT 7
BISD BOND PROGRAM PROBABLE COST
FEBRUARY 2006

PROJECT	PROBABLE COST
New Elementary School	$10,370,000
Crockett Renovation and Additions (Optional)	$1,783,000
Sitework and Relocated Track	$884,000
Replace Electrical Systems	$3,403,000
Renovate High School Auditorium	$1,000,000
Transportation Purchases	$500,000
Demolish Existing Ag Building	$75,000
Construct New High School Ag Building	$675,000
Convert High School Science to Art	$150,000
Renovations for Special Needs	$150,000
Renovate High School Science	$2,500,000
Demolish Crockett	$150,000
Construct New Crockett	$4,250,000
Transportation Purchases (Phase 2)	$500,000
Additional Improvements to High School	$5,085,000
Additional Improvements to Middle School	$4,282,000
Additional Improvements to Paul Belton	$3,369,000
Demolish South Campus and Build Wrestling Practice	$720,000
Total	**$39,846,000**

SOURCE: BISD, Potential Bond Package Option, May 2008.

must be used for the construction or renovation of an instructional facility. The IFA program operates with applications and has award cycles. The award cycles include the property wealth per student of the districts as criteria in ranking the districts for funding.

BISD levied a $0.2787 tax rate per $100 of assessed valuation in 2007-08 to pay the district's debt service payments. In 2007–08, the district received $1,176,664 in EDA funding to assist in making the district's debt service payments. The district applied for IFA but did not receive IFA funding from Round 8 (June 2006) of $315,316. **Exhibit 8** presents the I&S tax rate, taxable values and a calculated tax levy for BISD from 2003–04 through 2007–08. BISD did not have any outstanding bonded debt before the issuance of the bonds approved by the voters in May 2006.

BISD received less than 100 percent of the calculated I&S levy (**Exhibit 8**) in 2006–07. In 2007–08, BISD has budgeted $1,267,707 in local revenues which is less than the tax levy of $1,351,088. In addition, BISD has received EDA funding to assist in the payment of debt service. **Exhibit 9** presents the debt service fund expenditures and revenue for 2003–04 through 2007–08. The prepaid interest in 2006–07 is from the proceeds of the bond sale.

IMPACT

BISD reported that not receiving the IFA had a direct impact on the capital improvement plan. BISD proposed a three phase planning package for the 2006 bond election. The total package contained $39.8 million in projects with $17.9 million to be funded from local taxes, $3.6 million in projects to be funded if the district received IFA funding, and $18.3 million in projects if the district received EDA funding. Since the district did not receive the IFA funding, the projects proposed in the bond election were reduced to keep the proposed I&S tax rate at a maximum of $0.295 per $100 taxable value.

BISD issued the authorized bonds in two sales in 2006 and 2007. The district incurred issuance costs that aggregated more than the costs associated with a single bond issue; however, the district saved interest costs for a year with the separate issues.

For the 2006 bond program, the district used a combination of current interest bonds (CIB) and capital appreciation bonds (CAB). CABs are bonds that do not require principal and interest payments annually, but accrete interest over the life of the bond until maturity and payment is due. The CABs mature in 2008, 2009 and 2010.

EXHIBIT 8
BISD INTEREST AND SINKING TAX RATE, TAXABLE VALUE, AND INTEREST AND SINKING TAX LEVY
2003–04 THROUGH 2007–08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	2007–08
Tax Rate	$0.00000	$0.00000	$0.00000	$0.29500	$0.27870
Taxable Values	$419,406,805	$425,790,655	$437,409,173	$457,322,036	$484,782,173
Tax Levy	$0	$0	$0	$1,349,100	$1,351,088

SOURCE: Texas Education Agency, CPTD Tax Final, 2003–04 through 2006–07; State Comptroller's Office, School and Appraisal Districts Property Value Study 2007; BISD, Annual Audit Report 2006–07, Debt Service Fund Budget 2007–08; and Calculation by Consultant, May 2008.

EXHIBIT 9
BISD DEBT SERVICE FUND
2003–04 THROUGH 2007–08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	BUDGET 2007–08
Debt Payments	$0	$0	$0	$1,523,569	$2,431,062
Local Revenue	$0	$0	$0	$1,319,854	$1,267,707
Prepaid Interest	$0	$0	$0	$273,861	$0
EDA	$0	$0	$0	$0	$1,176,664

NOTE: Existing Debt Allotment (EDA).
SOURCE: BISD and Texas Education Agency, Annual Audit Reports, 2007–08 Budget, May 2008.