Van Alstyne Independent School District

FACILITIES MANAGEMENT REVIEW

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

March 2009

LEGISLATIVE BUDGET BOARD

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March 30,2009

Dr. Alan Seay
Superintendent
Van Alstyne Independent School District

Dear Dr. Seay:

The attached report reviews the management and performance of the Van Alstyne Independent School District's (VAISD) facilities operations.

The report's recommendations will help VAISD 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: Mr. Kyle Beall
Mr. David Kerr
Ms. Kim Weber
Ms. Holly Carter
Mr. Rodney Carroll
Mr. John Allen
Ms. Misha Frey

VAN ALSTYNE 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 programs to provide safe, productive, and clean environments where students can learn.

Van Alstyne Independent School District (VAISD) is located in the southern portion of Grayson County and the northern portion of Collin County, Texas. In recent years there have been high rates of student enrollment growth in Collin County located just south of the district as development of communities have extended north into the Dallas suburbs. The outward push of development has made student enrollment growth a primary concern in VAISD. However, the recent downturn in the economy has tempered new residential development in Van Alstyne. In a demographics study provided to the district by an architectural firm, VAISD is projected to grow its enrollment by 7.6 percent over the next five years.

With the current and forecasted growth and change comes an opportunity for improvement in facilities operations and maintenance. Practices and processes that once were sufficient and even advanced for the setting may quickly become antiquated.

The facilities organization is responsible for a diverse set of facilities covering over 300,000 square feet (**Exhibit 1**).

Facilities is led by a Maintenance Director who directly supervises two full-time equivalents (FTEs) in maintenance and grounds. The current Maintenance Director has announced his retirement in December 2008. The current division of labor is shown in **Exhibit 2**.

The following sections provide a summary of findings and recommendations regarding facilities management, operations and use issues for VAISD. The information is based on field visits, interviews, document review, and observations completed at the district in May 2008.

EXHIBIT 1
VAN ALSTYNE ISD FACILITIES INVENTORY
MAY 2008

BUILDING	YEAR BUILT	RENOVATION DATE	SQUARE FEET
High School	2003	2005 – Add Wing	100,424
High School Athletic Training Center	2007		21,000
Middle School	1972	1986 – Add Intermediate School Classrooms	89,011
Elementary School	1998		61,686
College Street Classroom	1953		9,952
College Street Gym	1936		9,916
College Street Cafeteria	1946	2007 – Roof	3,200
Superintendent's Office	1946	2003	1,820
Portable #1	1989		2,700
Portable #2	1984		1,728
Agriculture Farm	1983		
Total			**301,437**

SOURCE: Van Alstyne ISD, Superintendent.

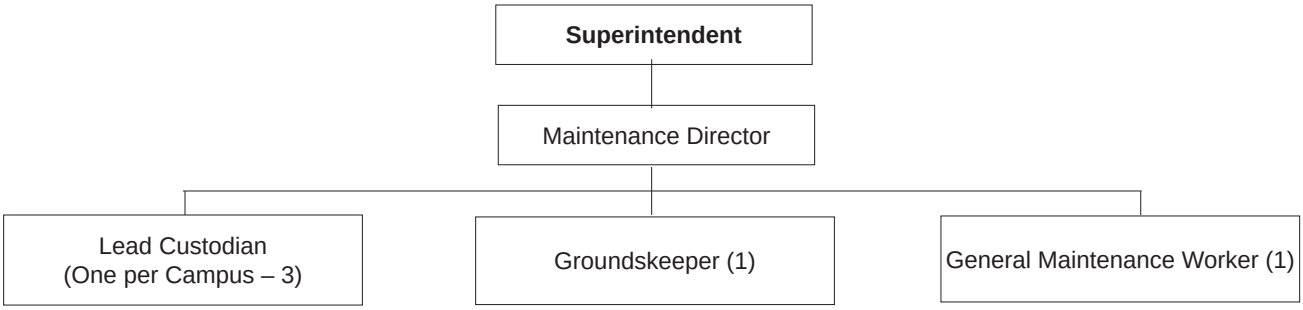
ACCOMPLISHMENT

- VAISD implemented an online submittal and approval of work requests process.

FINDINGS

- Finding #1 – Facilities staff lack the training required to strategically drive the facilities organization beyond its current stage as it prepares and operates through the forecasted growth.
- Finding #2 – Facilities staffing levels have not kept pace with the growth and increased space requirements to be maintained.
- Finding #3 – There is limited use of facility management information technology making it difficult to track performance and obtain good data to make decisions.
- Finding #4 – The maintenance program is corrective in nature and performs filter replacements, with limited resources to perform preventive maintenance.

EXHIBIT 2
VAN ALSYTNE ISD MAINTENANCE ORGANIZATION CHART
MAY 2008



SOURCE: Van Alstyne ISD, Superintendent.

- Finding #5 – Document storage lacked definition or apparent reason, negating the usefulness of as-built drawings and Operations and Maintenance (O&M) manuals.
- Finding #6 – While contracts are in place to help with energy management and preventive maintenance, the contracts are not being managed/executed appropriately to benefit the district.
- Finding #7 – While there are many good facilities initiatives and effective processes, they are informal and lack documentation.
- Finding #8 – While there have been some efforts to initiate a master plan, no formal master plan exists.
- Finding #9 – There is no current process of assessing facility condition, identifying deferred maintenance backlogs, or evaluating capital needs of the existing facilities.
- Finding #10 – There is no internal training program or tracking mechanism for external training completed.

RECOMMENDATIONS

- **Recommendation 1: Strategically hire a new Maintenance Director** with the skills necessary to be part of the management team and strategically drive the facilities organization to meet the long-term mission of the district.
- **Recommendation 2: Increase maintenance staffing levels** to be in alignment with industry benchmarks and provide adequate resources to properly maintain the growing inventory of facilities.
- **Recommendation 3: Implement a simple and cost-effective automated work order management system** (Computerized Maintenance Management System – CMMS).
- **Recommendation 4: Implement a comprehensive planned maintenance program.**
- **Recommendation 5: Formalize and document facilities planning and maintenance policies and procedures.** This may include formalizing processes for the following:
  - master planning;
  - school design and facility performance guidelines;
  - value engineering and post-occupancy reviews;
  - maintainability reviews during design phases;
  - school commissioning;
  - facilities documentation exchange and control;
  - facilities management information standards;
  - facilities performance measurement (key performance indicators);
  - capital needs assessment; and
  - contract oversight and control.
- **Recommendation 6: Initiate a periodic facility condition assessment (FCA) process** to prepare annual asset management plans and to forecast future facility capital needs.
- **Recommendation 7: Initiate a comprehensive training program** by developing individual training plans to minimize possible on-the-job-accidents, staff inefficiencies, and repeat work.

DETAILED ACCOMPLISHMENT

AUTOMATED SUBMITTAL AND APPROVAL OF WORK REQUESTS

The district implemented an online submittal and approval of work requests process.

VAISD's Maintenance Department, in conjunction with the Technology Department, developed a process for the online submittal and approval of work requests using email on the district's intranet. The process represents a good example of the proper use of available resources through collaboration to improve district communication. Teachers and administrators are able to access a custodial/maintenance or transportation request form via the district's intranet.

A request submitted by a teacher is automatically routed via e-mail to their supervising administrator for approval before the request is submitted to be completed. Approval is accomplished through forwarding the e-mail to the Superintendent's secretary. The Superintendent's secretary prints the request on colored paper (blue for custodial maintenance request and white for transportation requests) and highlights pertinent information to help make the process more identifiable to the maintenance crew. The printed work requests are collected by the maintenance crew and the process becomes paper driven going forward. Services for emergency/high priority items are still received/dispatched via telephone.

DETAILED FINDINGS

NEW MAINTENANCE DIRECTOR

Finding #1 – Facilities staff lack the training required to strategically drive the facilities organization beyond its current stage as it prepares and operates through the forecasted growth.

Recommendation 1: Strategically hire a new Maintenance Director with the skills necessary to be part of the management team and strategically drive the facilities organization to meet the long-term mission of the district.

The current Maintenance Director has announced his retirement in December 2008. With his retirement, VAISD has an opportunity to be proactive in the hiring of a new Maintenance Director with the skills necessary to be a crucial part of the management team and strategically drive the facilities organization.

To keep up with today's facilities demands, the role of Maintenance Director is to develop, direct, organize and administer 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;
- sustainable facility management policy 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.

Understanding the finite budgets districts work with, it may 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 that is also energetic about strategy and progression is imperative to the district's progression.

One of the first tasks the district should undertake upon the hiring of the new maintenance director is to develop a facilities master plan.

MAINTENANCE AND GROUNDS STAFFING

Finding #2 – Facilities staffing levels have not kept pace with the growth and increased space requirements to be maintained.

Recommendation 2: Increase maintenance staffing levels to be in alignment with industry benchmarks and provide

adequate resources to properly maintain the growing inventory of facilities.

Growth of the district has stressed facilities resources. Facilities staffing levels have not kept pace with the growth and increased space to be maintained. VAISD's staffing levels do not meet recommended industry standards.

MAINTENANCE

The district maintains 301,437 square feet of facilities with two full-time equivalent (FTE) maintenance positions. The maintenance department's FTEs include the Maintenance Director and one general maintenance worker. The general maintenance worker spends approximately 70% of his time responding to corrective work orders or demand service requests. Preventive maintenance is limited to filter changes.

The district's ratio of maintenance staff per square foot is 1:150,718, while the standards published in the American School and University M&O Cost Study is 1:107,439 (AS&U, 2008). Therefore, this staffing guideline would suggest that the district is understaffed by at least one FTE according to industry averages. The district did not provide the review team with any written or verbal staffing guidelines for which maintenance and grounds staffing decisions were made.

Published staffing guidelines are a good starting point for determining the appropriate number of FTEs; however, they do not take into account the desired level of service. 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 in **Exhibit 3.**

A modified approach to this measure is often more useful because it gives customers the latitude to determine the desired service level for a given facility and then match their expenditures and level of effort to the desired outcome. This approach recognizes that not all facilities need to be maintained at the same rate. It allows the maintenance leadership to evaluate its portfolio and assign variable service levels as customer needs, capital funds availability, and operating budgets dictate.

Based on the Level of Service benchmarks by APPA, the review team found that Maintenance at VAISD is currently being performed between level 3 or 4, Managed Care to Reactive Management—as outlined in **Exhibit 3.** Customer service and response time, customer satisfaction, and building systems' reliability is at a Level 2 – Comprehensive Stewardship. The bolded portions of the table provide the evaluation team's interpretation of the level of service by performance area, based on site visits and interviews. VAISD does not maintain comprehensive work records to verify all information; therefore, the exhibit is based on information gathered through observations and interviews.

Upon a general walk-through of the facilities, one will find a comfortable yet variable climate and atmosphere; however, it was made clear through interviews with the Maintenance Director that the preventive maintenance program is limited. Because of the age of the high school and elementary school, finishes and equipment are like new. Capital equipment does not display visual signs of deterioration. Therefore, most capital expenditures over the next five years are related to life-cycle renewal. A significant capital improvement project is being undertaken to upgrade the infrastructure and finishes at the middle school.

The optimal level of service for a curriculum based facility should be a Level 2 – Comprehensive Stewardship (**Exhibit 3**). Maintaining current staffing levels will only yield between a Level 3 and Level 4 in the future. Because of the age of the facilities, the maintenance organization has been able to provide a higher level of service with fewer staff. As the facilities continue to age, this same level of service will be unachievable without the appropriate increase in staff.

Based on published staffing benchmarks and the APPA Level of Service model, VAISD's current level of service with two FTEs is between Level 3 – Managed Care and Level 4 – Reactive Management as outlined in **Exhibit 4**. **Exhibit 5** outlines the actual verses recommended staffing to maintain the facilities at VAISD. In order to achieve a level of service appropriate for an educational environment, staffing should be increased.

If VAISD increases staffing to recommended levels, the fiscal impact would be an annual cost of $28,704 ($11.50 X 1.2 (20.0% Benefits) X 8 Hours/Day X 260 Days/Year X 1 FTE) based on industry average mid-point pay for a maintenance worker.

GROUNDS

The district occupies just over 131 acres of land; however, mowing for approximately 60 acres is contracted out, leaving 71 acres for in-house staff to maintain. The Maintenance Director indicated that this is the first year the district has had an in-house employee responsible for grounds maintenance. Grounds maintenance previously was an outsourced function. The Maintenance Director indicated a drop in service level as a result of the change, but attributed the drop to a lack of training and experience. Current grounds maintenance responsibilities include general lawn

EXHIBIT 3
VAN ALSTYNE ISD CURRENT MAINTENANCE 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 environ.	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.
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 and leaky windows, unpainted, cracked panes, significant air & water penetration, poor appearance.
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, hardware missing.

EXHIBIT 3 (CONTINUED)
VAN ALYSTNE ISD CURRENT MAINTENANCE LEVEL OF SERVICE
MAY 2008

LEVEL	1	2	3	4	5
SQUARE FEET	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
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, w/out 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. Equip. & building components are routinely broken and inoperable. Service 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.

EXHIBIT 4
VAN ALSTYNE ISD CURRENT MAINTENANCE LEVEL OF SERVICE AND MATCHING STAFFING CRITERIA
MAY 2008

LEVEL	1	2	3	4	5
SQUARE FEET	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
301,437	3.74 FTEs	2.81 FTEs	2.02 FTEs	1.46 FTEs	0.97 FTEs

NOTE: Full-time Equivalents (FTEs)
SOURCE: Van Alstyne ISD, School Review Surveys, May 2008.

EXHIBIT 5
VAN ALSTYNE ISD ACTUAL VS. RECOMMENDED MAINTENANCE STAFFING PER DESIRED LEVEL OF SERVICE
MAY 2008

SQUARE FEET	CURRENT STAFF	CURRENT LEVEL OF SERVICE	STAFF FOR CURRENT LEVEL OF SERVICE	DESIRED LEVEL OF SERVICE	RECOMMENDED STAFFING	DIFFERENCE ACTUAL VS. RECOMMENDED
301,437	2 FTEs	Level 3	2.02 FTEs	Level 2	3 FTEs	1 FTE

NOTE: Full-time Equivalents (FTEs)
SOURCE: Van Alstyne ISD, School Review Surveys, May 2008.

maintenance (i.e. mowing, weed whacking, general policing).

The grounds maintenance at VAISD is currently being performed between a Level 3 – Managed Care and Level 4 – Reactive Management – with turf care operated at a Level 2, as outlined in **Exhibit 6**. The bolded portions of the table provide the review team's interpretation of the level of service by performance area, based on site visits and interviews. VAISD does not maintain comprehensive work records to verify all information; therefore, the exhibit is based on information gathered through observations and interviews.

Based on published staffing standards and the APPA Level of Service model, VAISD's current level of service at 1 FTE should be a Level 5 – Crisis Response as outlined in **Exhibit 7**. The review team estimates actual level of service to be an average of Level 3 – Managed Care and Level 4 – Reactive Management. **Exhibit 8** outlines the actual verses recommended staffing to maintain the grounds at VAISD. In

EXHIBIT 6
VAN ALSTYNE ISD GROUNDS CURRENT LEVEL OF SERVICE
MAY 2008

LEVEL	1	2	3	4	5
DESCRIPTION	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
Turf Care	Grass height maintained. Mowed at least once every five days and as often as once every three days.	**Grass cut once every five days.**	Grass cut once every ten working days.	Low-frequency mowing scheduled based on species.	Low-frequency mowing scheduled based on species.
Fertilizer	Adequate fertilization applied to plant species according to their optimum requirements.	Adequate fertilizer level to ensure that all plant materials are healthy and growing vigorously.	Applied only when turf vigor seems to be low.	**Not fertilized.**	Not fertilized.
Irrigation	Sprinkler irrigated - electric automatic commonly used. Frequency of use follows rainfall, temperature, season length, and demands of plant material.	Sprinkler irrigated - electric automatic commonly used. Frequency of use follows rainfall, temperature, season length, and demands of plant material.	**Dependent on climate.**	No irrigation.	No irrigation.
Litter Control	Minimum of once per day, seven days per week.	Minimum of once per day, five days per week.	**Minimum service of two to three times per week.**	Once per week or less.	On demand or complaint basis.
Pruning	Frequency dictated primarily by species and variety of trees and shrubs.	Usually done at least once per season unless species planted dictate more frequent attention.	When required for health or reasonable appearance.	**No regular trimming.**	No pruning unless safety is involved.
Disease and Insect Control	Controlling objective is to avoid public awareness of any problems.	Usually done when disease or insects are inflicting noticeable damage, are reducing vigor or plant material, or could be considered a bother to the public.	**Done only to address epidemics or serious complaints.**	None except where the problem is epidemic and the epidemic condition threatens resources or the public.	No control except in epidemic or safety situations.
Snow Removal	Snow removal starts the same day that accumulations of .5 inch are present.	Snow removed by noon the day following snowfall.	Done based on local law requirements but generally accomplished by the day following snowfall.	**Done based on local law requirements but generally accomplished by the day following snowfall.**	Done based on local law requirements but generally accomplished by the day following snowfall.
Surfaces	Sweeping, cleaning, and washing of surfaces should be done so that at no time does an accumulation of sand, dirt, or leaves distract from the looks or safety of the area.	Should be cleaned, repaired, repainted, or replaced when their appearances have noticeably deteriorated.	Cleaned on complaint basis. Repaired or replaced as budget allows.	**Replaced or repaired when safety is a concern and when budget is available.**	Serviced only when safety is a consideration.

EXHIBIT 6 (CONTINUED)
VAN ALSTYNE ISD GROUNDS CURRENT LEVEL OF SERVICE
MAY 2008

LEVEL	1	2	3	4	5
DESCRIPTION	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
Repairs	Repairs to all elements of the design should be done immediately.	Should be done whenever safety, function , or appearance is in question.	Should be done whenever safety or function is in question.	**Should be done whenever safety or function is in question.**	Should be done whenever safety or function is in question.
Inspections	A staff member should conduct inspection daily.	A staff member should conduct inspection daily.	Inspections are conducted once per week.	**Inspections are conducted once per month.**	Inspections are conducted once per month.
Floral Plantings	Maximum care, including watering, fertilizing, disease control, disbudding, and weeding, is necessary. Weeding is done a minimum once per week.	Care cycle is usually at least once per week, but watering may be more frequent. Bed essentially kept weed free.	**Only perennials or flowering trees or shrubs.**	None.	None.

SOURCE: Maintenance Staffing Guidelines Grounds Management, The Association of Higher Education Facilities Officers, 2002.

EXHIBIT 7
VAN ALSTYNE ISD GROUNDS CURRENT LEVEL OF SERVICE AND STAFFING CRITERIA
MAY 2008

LEVEL	1	2	3	4	5
ACREAGE	SHOWPIECE FACILITY	COMPREHENSIVE STEWARDSHIP	MANAGED CARE	REACTIVE MANAGEMENT	CRISIS RESPONSE
71	4.05 FTEs	3.03 FTEs	2.19 FTEs	1.58 FTEs	1.05 FTEs

NOTE: Full-time Equivalents (FTEs)
SOURCE: Van Alsytne ISD, School Review Surveys, May 2008.

EXHIBIT 8
VAN ALSYNE ISD GROUNDS ACTUAL VS. RECOMMENDED STAFFING PER DESIRED LEVEL OF SERVICE
MAY 2008

CURRENT STAFF	CURRENT LEVEL OF SERVICE	STAFF FOR CURRENT LEVEL OF SERVICE	DESIRED LEVEL OF SERVICE	RECOMMENDED STAFFING	DIFFERENCE ACTUAL VS. RECOMMENDED
1	Level 3/4	2.19/1.58 FTEs	Level 2	3 FTEs	2 FTEs

NOTE: Full-time Equivalents (FTEs)
SOURCE: Van Alsytne ISD, School Review Surveys, May 2008.

order to achieve a level of service appropriate for an educational environment, staffing should be increased.

If VAISD decides to increase staffing to recommended levels, the fiscal impact would be an annual cost of $47,424 ($9.50 X 1.2 (20.0% Benefits) X 8 Hours/Day X 260 Days/Year X 2 FTEs) based on industry average mid-point pay for groundskeepers.

If VAISD increases staffing to the recommended levels both for maintenance staff and groundskeepers, the fiscal impact annually would be $76,128 ($28,704 + $47,424).

FACILITY MANAGEMENT INFORMATION TECHNOLOGY

Finding #3 – There is limited use of facility management information technology. This makes it difficult to track performance and obtain good data to make decisions.

Recommendation 3: Implement a simple and cost-effective automated work order management system (computerized maintenance management system – CMMS).

Facility management information technology at VAISD is currently limited to an e-mail trail of work requests. The work requests are categorized by type and kept for an unspecified duration after being printed. Craftspersons are

dispatched by the Maintenance Director via cell phone. There is no feedback mechanism available to the Maintenance Director after work has been completed, therefore impeding his ability to track performance and make informed decisions.

Computerized Maintenance Management Systems (CMMS) is a type of facility management information technology whose purpose is to automate and manage work requests as efficient as possible and provide the basic information districts need to make informed and timely decisions. The benefits of automation include:

- better management data;
- increased efficiency;
- better tracking of asset/equipment;
- organizes facilities management data & information;
- expedited decision-making;
- improved maintenance quality/labor tracking;
- improved communication;
- reduced operating costs; and
- enhanced use of facility space.

Many CMMS software packages offer components 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.

Recommendations include the following:

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 CMMS systems fail because the data is not standardized and maintainable. Proper implementation and use of data standards will lead to valuable and effective information and work management systems. Because there are currently no CMMS systems in use at VAISD, there is an opportunity to do it right the first time.

Any automated system should be implemented as a tool to support business processes. Thus, it is imperative to document work processes prior to implementing technology. Then a specific set of data standards should be established to provide 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 facility 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 overpopulate the system, had good internal electronic communication in place, had a dedicated automation manager, had buy-in from top to bottom of the organization, understood all costs, and maintained good administrative procedures.

The success factors in creating a strategic technology plan include 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, the district should create a formal Technology Advisory Team (TAT) for this project. 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 team is responsible for overseeing implementation and optimization, data integrity and application stewardship, adjudicating resource allocation, evaluating, and recommending future needs and requirements. The team is also responsible for maintaining the data and data standards. The team must "own" the technology vision and also be the vehicle for maintaining momentum.

The district should consider a team consisting of a:

- Maintenance Supervisor;
- Information Technology (IT) Manager(s); and
- Chief Financial Officer.

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 IT work for us?
- How do we gain commitment?
- Is our 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. However, in the case of small to medium districts like VAISD the team may not change size.

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 look at the strategic objectives of the organization and mirror them with the technology they are trying to implement. A close evaluation of the existing service level should be made to benchmark the organization. Next, a determination must be made on the organization's desired service level. Finally, the team must link the organization's technology goals to help achieve the desired service level.

Typical Facility Management (FM) technology projects incur problems, such as too much reliance on vendor claims or a sense of urgency that shortcuts methodical implementation. The following lists common steps to take and to avoid so that the district will get the benefits from FM technology while maintaining cost control:

- Identify detailed functionality from FM technology that would benefit both Plant Operations' clients and staff;
- Emphasize training;
- Understand all costs;
- Ask inappropriate questions about how things are done;
- Test applications yourself; don't just watch demonstrations;
- Try prototypes and get feedback from users;
- Start by fixing small problems to win support;
- Structure big projects so there are payoffs along the way;

- Select your best employees for implementation;
- Settle for 80% solutions; and
- Agree on realistic goals.

Make sure not to:

- overpopulate the database;
- try to use a large project to cover costs;
- set vague objectives such as "improve productivity;"
- structure the implementation to avoid conflict;
- select a technical implementation leader unskilled in negotiation;
- assume that interviewing users reveals exactly what they need; and
- emphasize incremental improvement if what you really need is fundamental change.

If the district considers CMMS systems, 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;
- use a predetermined scorecard for evaluation;
- weight evaluation criteria;
- have vendors demo at your facility; and
- provide incentives for value engineering.

CMMS systems for school districts are typically charged an annual usage fee based on student populations and desired modules. A school district like VAISD would expect to pay annual fees of $1,700 and a one time implementation and training fee of $950 and in return receive both a web-based work order and preventive maintenance module.

COMPREHENSIVE MAINTENANCE PROGRAM

Finding #4 – The maintenance program is corrective in nature. While they do perform filter replacements, they have limited resources to perform other types of preventive maintenance.

Recommendation 4: Implement a comprehensive planned maintenance program.

VAISD's maintenance program is insufficient to provide the long-term stewardship needed to preserve the district's facilities. VAISD's maintenance program consists mainly of breakdown maintenance, corrective actions, responding to demand work requests, periodic facility inspections, and filter replacements. The district contracts with a third party to provide preventive maintenance at the High School. The Maintenance Director reported that they spend up to an hour a day moving items and up to an hour and a half gassing and prepping buses. This only leaves just over 65% of available time for maintenance items. Industry standards suggest that in a given day there is only 65% of total time that is productive wrench turning time. Subtracting out the moving and bus preparation time from productive time leaves approximately 3.5 hours per day for wrench turning time. A total of 3.5 hours is an insufficient amount of time to provide the necessary attention to perform a comprehensive maintenance program.

There was little evidence of preventive maintenance (PM) being performed on any equipment beyond that described above, with very little historical documentation of the work performed. VAISD has yet to realize the impact of not performing the appropriate maintenance because of the relatively new age of facilities; however, continuing to neglect investing in a formalized maintenance program will result in inordinate expenditures and a shortened useful life.

With few exceptions PM 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.

Reliability Centered Maintenance (RCM) is a preventive maintenance process that identifies actions that will reduce the probability of unanticipated equipment failure that are the most cost effective. 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. RCM was developed to include the optimal mix of reactive-, time- or interval-based, and condition-based maintenance.

A streamlined RCM process allows organizations to use their scarce personnel and funding resources to support the most critical assets that have the highest probability of failure to the organization's mission.

Streamlined RCM programs have several clear benefits:

- Managers, not equipment, plan shop technician's 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 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) are 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 here:

- *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 detects and analyzes 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.

Determination of the right type of maintenance for various equipment types can be determined by following a logic-tree decision-making process as shown in **Exhibit 9**.

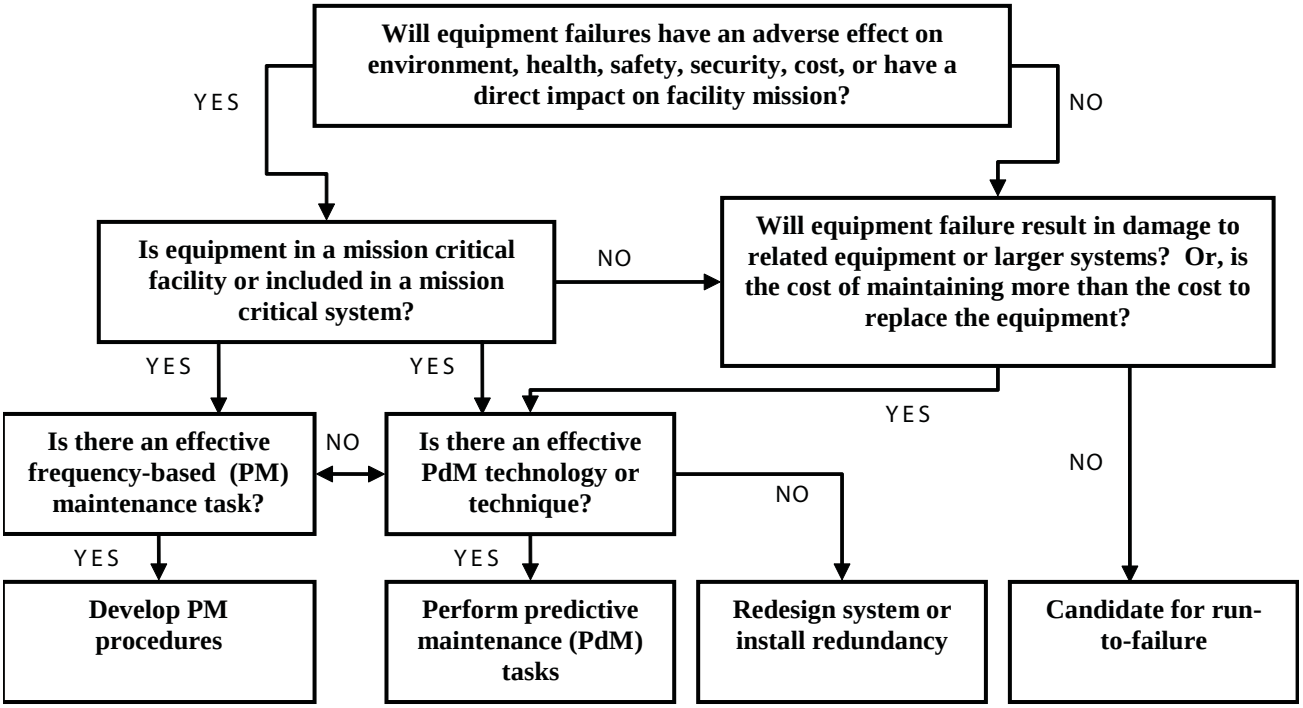
The district should implement a comprehensive maintenance program to improve the stewardship of their facilities and increase the total cost of ownership of their assets. A comprehensive maintenance program includes the right mix of preventive maintenance (PM), predictive maintenance (PdM), and reactive maintenance (i.e., passive monitoring) components.

To develop a comprehensive maintenance program VAISD 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 – Comprehensive maintenance programs begin with a facilities assessment to identify the various assets' systems and maintainable 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 in which to work from. Knowing the age and condition of equipment is a prerequisite for maintaining it properly. For more about facilities asset identification and assessments see Recommendation 6.

Step 2: Prioritizing Maintenance Activities – Once the facilities data has been compiled, the logic tree described in **Exhibit 9** can be applied to help determine at what level each piece of equipment should be maintained. Equipment to be included in the maintenance program should be selected based on the cost of performing advanced maintenance weighed against the cost impact of deferring the maintenance.

EXHIBIT 9
RELIABILITY CENTRAL MAINTENANCE LOGIC TREE
MAY 2008



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

Information should be obtained during the data collection process to associate a priority with each system and asset in each district facility. 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 how important the function of a system and its components are relative to the identified mission. A numerical ranking of one through ten can be adopted and applied in accordance with **Exhibit 10**. The equipment can then be prioritized based on its criticality of maintaining functionality of the facilities or other predetermined district mission needs. Prioritization becomes increasingly important as available resources become more scarce.

The criticality factors for each piece of equipment in conjunction with the logic tree **(Exhibit 9)** can then be used to determine and adjust the level of service attributed to each piece of equipment based upon available resources.

Step 3: Developing Job Plan & Estimating Completion Times – Once the criticality 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, General Services Administration (GSA), 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.

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 problem, 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 the Maintenance Director will need to use some judgment about which tasks are most important. 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 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

EXHIBIT 10
CRITICALITY/SEVERITY ASSESSMENT CATEGORIES
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.

have access to these resources. Because of the relative newness of the district's facilities, pertinent equipment information can be abstracted from construction documents with relative ease since the associated maintenance tasks and times are provided by industry standard publications.

If internal resources are not capable or able to accomplish this task, additional resources (i.e. consultants) could be hired to aide 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. Multiplying $.05/square foot by the district's total square footage (301,437 square feet) equates to approximately $15,100.

POLICIES AND PROCEDURES

Finding #5 – The facilities planning, including maintenance policies and procedures, are not formalized and documented. For example, document storage lacked definition or apparent reason, negating the usefulness of as-built drawings and Operations and Maintenance (O&M) manuals.

Finding #6 – While contracts are in place to garner help with energy management and preventive maintenance, the contracts are not being managed/executed appropriately to benefit the district.

Finding #7 – While there are many good facilities initiatives and effective processes, they are informal and lack documentation.

Finding #8 – While there have been some efforts to initiate a master plan, no formal master plan exists.

Recommendation 5: Formalize and document facilities planning and maintenance policies and procedures. This may include formalizing processes for the following:

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

VAISD lacks formal and documented processes for many of their facilities planning, maintenance, and management efforts. While there are many good facilities initiatives and effective processes, they are informal and lack appropriate standards and documentation. The success of the informal processes that have served the district well in the past will be more difficult to achieve as the district continues to grow. With the probable change in leadership and hiring of new facilities staff, this is an opportune time to develop and formalize processes. This will benefit in training and developing new staff and optimizing the effectiveness of the new facilities organization.

VAISD should formalize and document facilities planning and maintenance policies and procedures to ensure effective planning, construction, operation and maintenance of the facilities. This should include formalizing processes for the following:

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

The implementation of formal and documented processes for facilities management could result in significant cost avoidance and increased staff efficiencies. While there is effort required to document the processes, it is generally small in comparison to the potential cost savings. Examples of potential cost avoidance and savings are presented in each of the following subsections.

MASTER PLANNING

Currently, short- and long-term planning is conducted primarily by the superintendent and school board with some support from one of the primary architectural firms. VAISD has looked at other school districts' master plans and has worked with the architect to develop preliminary demographic information to work from as a baseline for a plan. There is limited consideration of other factors, including: facility condition, life cycle analyses, long-term capital needs requirements, budgets, timelines, and impact of maintenance

programs. A more formalized master plan should be developed.

A school facility master plan is the "blueprint" for decision-making throughout the school district. It is a formal way of communicating the district's needs, priorities, and intentions to all stakeholders. The master plan also establishes the necessary documentation for stakeholders, funding authorities, and the community to approve funding. As such, the process of master planning establishes a forum through which interested members of the community can voice their opinions to school administrators. This collaborative planning process helps the community feel that their views are valued.

Good master plans include short- and long-term objectives linked to the mission and vision of the school district. A more detailed master plan would include the following:

- introduction;
- master plan definitions;
- district strategic objectives (mission, vision, values, initiatives);
- annual expenditures summary;
- historical school development and renewal;
- historical enrollment;
- enrollment projections;
- projected enrollment vs. permanent capacity;
- enrollment configurations;
  - current district grade configuration;
  - anticipated grade configuration changes; and
  - anticipated effects on facility needs;
- anticipated school boundary changes or consolidation of schools within the district;
- economic environment of the district;
- other community factors that will affect school facility needs;
- campus areas;
- general facility data;
- campus educational adequacy summaries;
- portable buildings used for academic purposes;
- review of maintenance practices and impact;
- facility condition assessment data;
- 10- to 20-year modernization / replacement program;
- prioritization of capital projects (new schools and renovations);
- cost assumptions;
- development options / alternatives;
- recommendations; and
- project specific timelines.

Carefully developed and comprehensive master plans provide information to the community and stakeholders that aids in the approval of bonds and funds sufficient to adequately maintain school facilities. Comprehensive master plans also provide adequate documentation to allow decision-makers to objectively and equitably prioritize needs and make better facility decisions.

DESIGN GUIDELINES

The completion of a new high school and major renovations underway at the middle school have been carried out without the aid of documented detailed school district education specifications or design guidelines. As the school district grows and key staff changes over time, the collection of intellectual knowledge in the schools will be critical. Failure to formally document improvements may lead to repeating mistakes of the past.

The best way to capture valuable intellectual knowledge regarding best practices in school design and use is to develop design guidelines or district education specifications for school design. The practice of developing the guidelines can and should incorporate the architect, facilities staff, superintendent, chief financial officer, and construction manager. The design guidelines should include: space and layout standards, materials, furnishings, mechanical systems, building automation systems, and other specialty construction.

VALUE ENGINEERING

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.

Value engineering is conducted informally by the construction manager and Superintendent of VAISD. It is currently more focused on cost control than long-term life-cycle value. There appears to be limited information captured from post-

occupancy reviews and maintainability of the schools. A more formal value engineering process would link the reviews with commissioning results, post-occupancy surveys, and long-term performance measured via the facilities maintenance department. Post occupancy input from principals, teachers, and school staff can lead to higher performing schools over time. Formalizing this process would lead to greater long-term value and enhanced functionality of the schools.

VAISD should develop a more detailed and documented value engineering process be implemented to help achieve essential school functions at the lowest life cycle cost consistent with required performance, quality, reliability, and safety. Value engineering is typically conducted in two phases. In the design phase, value engineering considers alternative design solutions to optimize the expected cost/value ratio of projects at completion. Concentrating value engineering efforts in the early stages of project design often affords greater savings and allows a change of direction, if appropriate, without affecting project delivery schedules. Emphasis is on obtaining maximum life cycle value for initial investments of the project. In the construction phase, contractors are encouraged to draw on their experience to propose changes that can reduce costs while maintaining or enhancing quality, value, and functional performance.

MAINTAINABILITY REVIEWS

Many of the schools (both new and old) have maintenance issues that may have been resolved by minor changes incorporated through a review of the designs by personnel familiar with the maintenance of the schools. There is currently limited involvement from the Maintenance Director in the review of school concept and design drawings. The facility maintenance and performance reviews by the Facilities Director and Energy Manager should be incorporated and documented. These reviews generally lead to reduced maintenance costs and often lower capital renewal costs over time.

It is generally accepted that the operations and maintenance costs of schools is in the range of two to four times the cost of construction over the life of a facility. Yet, most of the focus continues to be on design and construction. Even value engineering tends to primarily consider the reduction of first-time costs over the long-term maintainability of building systems. The potential to significantly impact the long-term operating costs should be enough to include the Maintenance Director in the review of systems and materials to be used in new schools.

COMMISSIONING

VAISD does perform some aspects of a formal commissioning process. The review team reviewed a test, adjust, and balance report by Advance Air Systems for the new high school. However, there is a lack of formal processes when the construction manager turns over a new facility to VAISD for use and occupancy.

Commissioning, in its most basic form, is the process of ensuring that building systems are operating in accordance with the design intent and the owner's requirements. More specifically, commissioning:

- defines the building systems performance criteria;
- provides a validated baseline for building performance; and
- provides a means of tracking and evaluating building performance over time.

New buildings and systems often do not operate as intended. When these systems do not operate correctly, they create problems for building occupants and for those managing the facility. Commissioning these systems ensures the building is performing as initially specified.

Commissioning is typically performed in new and existing buildings for a few key reasons:

- to verify that new or existing building systems are operating as designed;
- to identify unexplained rises in energy use;
- to identify an unexplained increased number of thermal comfort complaints; and/or
- to achieve Leadership in Energy And Environmental Design (LEED) certification for buildings.

Commissioning can uncover many building system errors that may not otherwise be found:

- ductwork disconnected from diffusers sending conditioned air to the above-ceiling space instead of the space to be conditioned;
- Variable Air Volume (VAV) box re-heat valves stuck open, causing over-heating of zones;
- un-insulated conditioned air ductwork located in unconditioned spaces;
- fans rotating backwards;
- lighting controls programmed incorrectly causing lights to stay on longer than necessary;

- cross-connected Heating, Ventilating, and Air Conditioning (HVAC) sensors, causing systems to over-heat and over-cool;
- clogged filters;
- improperly installed condensate drainage systems resulting in pooling water on the roof and creating the potential for roof damage;
- non-working duct smoke detectors; and
- non-working emergency and exit lights.

Because these problems were discovered and corrected as part of the commissioning process, the building owners gained systems that performed as designed and were safer. They also increased energy efficiency, cost less to operate, improved the overall safety, and had fewer tenant complaints.

Even brand new facilities do not always operate as they should. This may be due to poor design, poor construction, improper project close-out, lack of general coordination, or product/equipment failure. Whatever the reason, this causes costly inefficiencies in the building that are entirely avoidable. With a properly executed commissioning plan, the district can improve the building's performance, operate systems more efficiently, reduce operating costs, and decrease occupant complaints.

DOCUMENT MANAGEMENT

Experience has shown that institutional organizations and government agencies across the U.S. spend billions of dollars unnecessarily to re-collect or regenerate facilities data and information that has already been created in the past. This is information needed to properly operate, maintain, and improve facilities over their life cycle. Today, this information is also used by first responders in cases of emergency and decision-makers to make better decisions about facilities. Easy access to the data is essential.

There are several key issues to making this information useful. The data needs to be complete, comprehensive (right level of detail), standardized, well organized, and readily accessible. Best practices include providing specifications for designers and contractors to follow to generate and format the data. At a minimum, the facilities data compiled for every new school facility should include:

- project specifications;
- design drawings;
- design factors/ assumptions;
- shop drawings;
- as-built drawings;
- submittals;
- warranties;
- construction photographs;
- commissioning reports;
- general system/equipment descriptions;
- general operating instructions; and
- equipment inventories;
- equipment attributes;
- installation instructions;
- set-up/calibration instructions;
- equipment O&M manuals;
- start-up/shut down procedures;
- spare parts data;
- wiring diagrams;
- material safety data sheets (MSDS);
- preventive maintenance; procedures;
- facility plan with emergency shut-off locations.

Organization and formatting of the data on the CD should make it easy to find the information listed. Currently, documents and drawings on the CDs are not well organized and labeled. Placing documents in directories labeled as 'Specifications', 'Drawings', and 'PM Procedures' is best. Drawings should also be labeled and stored as complete sets by architectural system. O&M Manuals should be filed in accordance with CSI Masterformat or Omniclass guidelines. The equipment inventories and preventive maintenance procedures should be in a flat file format or database that can be easily migrated into a computerized maintenance management system.

PERFORMANCE MEASUREMENT

The development of sound data information standards and automating processes enhances facilities performance measurement and the accuracy of key performance indicators (KPIs). The objectives of automating work processes are, after all, to increase performance, measure facilities performance, and provide better information to make the best decisions regarding facilities.

The current performance measurement at VAISD is limited in scope and requires time-consuming manual data generation via spreadsheets. No performance measurement data was provided to the review team. There is no benchmark information regarding operational costs or capital expenditures per square foot. There are great opportunities to improve facilities performance through the development of more specific KPIs aligned with the mission and vision of VAISD.

Measuring facilities operations' performance in today's environment is the route to credibility. The focus must be on prevention, not cure, and there must be recognizable aims and achievable prioritized objectives. Metrics provide essential links between strategy, execution, and ultimate value creation.

There are many ways of identifying and developing metrics and KPIs for use in school facilities management performance measurement. It is also easy to find samples of hundreds of potential facility maintenance metrics. However, it is not easy to identify and implement the right metrics to link facility operations and maintenance to strategy. The right KPIs should focus on those services that have the most prominent place in VAISD's strategic plans. The right mix of KPIs should consider all three aspects of facilities performance:

- Inputs: Indicators that measure the financial, staffing, portfolio condition, and operating impacts from limited budgets/resources, construction, and renovation activities.
- Process: Indicators that measure how efficiently the department is performing its key process and tasks.
- Outcomes: Indicators that provide a measure of how successfully the facilities function is performing at the enterprise level.

Educational organizations at the forefront of their industry have developed best practices by using a balanced scorecard approach to KPIs. The balanced scorecard is an approach that integrates financial and non-financial performance measures to show a clear linkage between the institution's goals and strategies. Most balanced scorecards consider four perspectives: customer perspective, process perspective, learning and growth perspective, and a financial perspective. The framework set by the balanced scorecard approach provides an excellent methodology to measure overall performance as facilities mangers.

CAPITAL PLANNING

The topic of facility investments and capital planning for school facilities remains at the forefront of the educational facilities executive's world. School organizations across the U.S. are facing the largest collection of aging buildings ever encountered. Deferred maintenance backlogs continue to grow at unprecedented rates, while the toll it has taken on facilities is reaching critical levels. Current research and data support the need for better facility capital investments and asset management in order to:

- obtain objective and credible data to make the rational and informed facilities investment decisions through prioritizing needs;
- streamline facilities management processes and reducing the total cost of ownership;
- improve the condition of facilities;
- extend the life of assets through proper maintenance and repair funding and decisions;
- minimize safety and security risks at facilities;
- minimize the disruption to customers (passengers) and tenants caused by facility system failures by maximizing critical system reliability;
- enable optimal use of facilities and infrastructure in support of the agency/organizational mission; and
- improve overall stewardship of facilities and maximizing return-on-investment for stakeholders.

CONTRACT OVERSIGHT AND CONTROL

The review team found cases in which contracted services were not being performed as specified in the contracts with service providers. In one such case, services were terminated and there was no documentation of the termination of the services. When questioned, the Superintendent was unaware that the services were not being performed. After some investigation, an e-mail was produced by the contractor explaining the halt in certain services. There was no record of who sent the e-mail, simply a statement of "the customer feels…". Because of the halt in services since the inception of the contract, the district has missed opportunities to track energy data and possible opportunities for inspection maintenance in major mechanical equipment. These opportunity losses affirm that improvements are needed in contract administration during the post-award phase of contracting with respect to the district, policies and procedures, and processes to control oversight of contractor performance.

VAISD should adopt practices to more effectively manage facilities partners or service providers of out-sourced or out-tasked services. As an example, processes similar to those outlined in The Federal Acquisition Regulations, such that a Contracting Officer (CO) and a Contracting Officers Technical Representative (COTR) should be established to improve effectiveness. The CO, responsible for signing a contract on behalf of the organization, and the COTR, responsible for overseeing the work, should not be the same person, to avoid a conflict of interest. In a small school district formalities can be foregone, but the CO typically would be the Superintendent and the COTR would be the Maintenance Director.

VAISD should focus on the responsibilities of the Maintenance Director in order to improve contract administration within the district. The Maintenance Director should be a key player in the contract award and administration process. The Maintenance Director also acts on behalf of the Contracting Officer in contractual matters and is responsible for successfully overseeing completion of assigned contract tasks by contractors. The Maintenance Director's role is vital in ensuring successful contract execution and completion. This individual should also ensure that contractors fulfill contract terms and conditions, and that taxpayer dollars are prudently spent. It is essential that the Maintenance Director understand their responsibility and are provided with appropriate support, training experiences, and developmental tools to effectively perform these responsibilities.

The Maintenance Director also provides daily oversight and is in the best position to recommend adjustments to the contract that improve services and capture any cost saving opportunities for the district. Additionally, the maintenance director should conduct inspections, collect customer feedback on services, manage quality assurance inputs and data, and coordinate any activities by others, such as projects that will impact contract operations.

The Maintenance Director should become and remain familiar with the entire contract document and statement of work for services, and ensure that those contract requirements are identified and tracked for ongoing compliance, quality assurance and service provisions. The Maintenance Director may also act as the eyes and ears of the Contracting Officer. The Maintenance Director's inputs and recommendations on contractor performance, quality of services, payment requests, and whether to retain a contractor beyond the base contract period or option years are used directly in contract administration decision-making.

The following is a list of general duties and responsibilities for Maintenance Directors acting as COTRs:

- provide technical assistance to contract management in coordinating services under the contract;
- coordinate orientation sessions to contractor staff to acclimate and familiarize them to the agency and environment;
- conduct orientation briefings;
- monitor work performance under the contract;
- keep the contractor on target;
- coordinate evaluation procedures;
- transition operations from contract to contract;
- administer expenditures for services, materials, and equipment against annual allocations;
- ensure compliance by the contractor;
- develop contingency plans in case of a break in service;
- approve contractor's invoices for payment; and
- provide approval for all expenditures of funds by the contractor.

FACILITIES CONDITION ASSESSMENT PROGRAM

Finding #9 – There is no current process of assessing facility condition, identifying deferred maintenance backlogs, or for evaluating capital needs of the existing facilities.

Recommendation 6: Initiate a periodic facility condition assessment (FCA) process to prepare annual asset management plans and to forecast future facility capital needs.

Not having a facility condition assessment process has not presented major issues to date due to the overall relative young age of the main school facilities. However, as these schools age, capital planning procedures through an FCA process should be implemented to ensure the effective maintenance and repair of the schools. Failure to do so could result in significant unanticipated capital expenditures, increases in deferred maintenance backlogs, and deteriorating school conditions.

There is no formal planning process for projecting and funding short- and long-range capital replacement items, such as roofing systems, pavements, mechanical/electrical/plumbing (MEP) and life safety systems in the schools. Currently, the only process reported included the preparation of a single table listing the general condition of building systems for the eight owned and one leased facility. The table identified the years of service and condition of building system (including structure, foundation, plumbing, electrical, HVAC, floors, network wire, and roof) as poor, fair, good, or excellent.

While the current enrollment projections and school design planning is valuable, VAISD should initiate a periodic facility condition assessment (FCA) process to prepare annual asset management plans/existing facility capital needs forecasts. Comprehensive facilities master plans should include the following elements:

- a review of the district construction and improvement plans;
- five- to ten-year projections of enrollment by school, grade, and year;

- an analysis of school capacity over the planning period;
- a public input process to obtain community desires and needs;
- a five- or ten-year capital plan for existing facility maintenance and repair;
- a review of funding strategies; and
- an ongoing review and monitoring process for the plan.

The most important factor to achieve success in assessing the condition of school facilities is to evaluate needs without bias. There are a multitude of reasons to conduct FCAs. Some of the more common outcomes include:

- developing and justifying long-term or short-term capital budgets;
- identifying backlogs of deferred maintenance;
- identifying and prioritizing specific capital project needs;
- independently validating capital improvement project requirements; and
- verifying equitable distribution of capital funds among multiple schools.

The primary challenge that public educational facilities across the country have faced is that they have historically underfunded maintenance of capital assets. Compounded by a portfolio of aging schools and infrastructure and the need to constantly modernize building systems and technologies, educational facilities are accumulating backlogs of capital expenditures. Taken together, the accumulated backlog of maintenance and repair is generally referred to as "deferred maintenance."

Concern about the deterioration of educational environments led to a number of collaborative studies by both educational and government associations. The identification and reduction of deferred maintenance has been the primary driving force of asset management programs for educational facilities. The studies also led to the development of the Facility Condition Index (FCI), one of the most recognized metrics for facilities asset management performance measurement.

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 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 and capital renewal.

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 capable or able to accomplish this task, additional resources (i.e. consultants) could be hired to aide in the assessment. Outside consultants could typically be procured for $.10 /square foot to aide in the data collection and program setup. Multiplying $.10/ square foot by the district's total square footage (301,437 square feet) equates to approximately $30,144.

COMPREHENSIVE TRAINING PROGRAM

Finding #10 – There was no internal training program or tracking mechanism for external training completed.

Recommendation 7: Initiate a comprehensive training program by developing individual training plans to minimize possible on-the-job-accidents, staff inefficiencies, and repeat work.

VAISD does not currently have a formal training or professional development program. Limited training is offered outside of basic safety training and required certification training. VAISD's budget did not indicate funds set aside specifically for training.

Not investing in ongoing training 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.

Best practices show that 2-5% of a facility department's overall personnel operating budget should be spent on training and development. Although most organizations do not spend to this level, this best practice indicates the importance of training.

Training is the opportunity to educate employees in the most effective way to utilize the available resources and to ensure that people understand the environmental rules and regulations regarding 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. *The Planning Guide for Maintaining School Facilities* makes the following suggestions:

- sharing training costs with other organizations on a collaborative basis (e.g., training may be sponsored by several neighboring school districts or jointly by the school facilities department and the public works department in the same community);
- 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 is still related 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; and
- first responder operations.

Finally, ongoing evaluation of training efforts, including all aspects of the experience, should be built into the program for educating employees about the facilities and grounds. Good training is timely, informative, effective, and keeps teachers, staff, students and visitors healthy and safe.

The best training evaluations are the summaries of work orders related to the focus of the training. Have the number of requests for "the problem area" decreased since training was instituted in regards to that area? Those items in the work plan that can be directly tied to training issues should be set up on a tracking system to monitor on a regular basis.

This monitoring can serve multiple functions: to track the effectiveness of the training; to be able to lobby for more money to do more training when the results are good; and to help identify areas where further training may be required.

VAISD should develop individual staff training plans for each employee. The Maintenance Director should conduct formalized training specific to all job operations and safety related to their staff's 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. It is also recommended that facility management staff document all safety related training conducted and that these documents be stored at a designated document center for easy access and reference for management and employees alike. Videotaping of training sessions is encouraged for future reference and training opportunities.

Exhibit 11 identifies what training is typically included in a comprehensive training program, as well as indications of how such training is generally delivered and who should receive it. Potential future positions have been included to increase relevance over time as dynamics and responsibilities change.

As best practices show that 2-5% of a facility department's overall personnel budget should be spent on training and development, approximately $6,000 per year should be allocated for Maintenance Department training.

EXHIBIT 11
TRAINING GUIDELINES
AUGUST 2008

	M & O Director	Maintenance Supervisor/Lead	HVAC Mechanic	Electrician	Plumber	Carpenter	Maintenance Generalist	Painter	Ground Crew Leader	Grounds Worker	Clerk		Online	Video	Peer Delivered	Outside Provider
Asbestos Awareness	x	x	x	x	x	x	x	x				Regulatory	x			
Bloodborne Pathogens Safety	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Combustible & Flammable Liquids	x	x	x	x	x	x	x	x	x	x			x	x		
Confined-Space Entry	x	x	x	x	x		x						x	x		
Hazard Communications	x	x	x	x	x	x	x	x	x	x	x		x		x	
HAZ-MAT Spill Prevention & Control	x	x	x	x	x	x	x	x	x	x			x			
Lock-Out/Tag-Out	x	x	x	x	x		x						x		x	
Materials Handling, Storage, Use & ID	x	x	x	x	x	x	x	x	x	x	x		x			
Alcohol-Free Workplace	x	x	x	x	x	x	x	x	x	x	x	General Training	x			
Back Injury Prevetion	x	x	x	x	x	x	x	x	x	x			x		x	
Building Evacuation & Emergencies	x	x	x	x	x	x	x	x	x	x	x				x	
Emergency Response	x	x	x	x	x	x	x	x	x	x	x				x	
CPR Academic	x	x	x	x	x	x	x	x	x	x			x		x	x
Disaster Preparedness	x	x	x	x	x	x	x	x	x	x	x		x		x	
Electrical Safety	x	x	x	x	x	x	x						x	x	x	
Eye Safety	x	x	x	x	x	x	x	x	x	x			x	x	x	
Fall Protection	x	x	x	x	x	x	x	x					x	x		
Fire Extinguisher Safety	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Fire Prevention Safety	x	x	x	x	x	x	x	x	x	x	x		x	x		
General Contruction Safety	x	x	x	x	x	x	x	x					x	x		
General First Aid	x	x	x	x	x	x	x	x	x	x	x		x		x	x
Golf Cart	x	x	x	x	x	x	x	x	x	x	x			x	x	
Forklift		x	x	x	x	x	x	x	x	x				x	x	
Bucket Truck		x	x	x	x	x								x	x	
Job Specific Equipment		x	x	x	x	x	x	x	x	x				x	x	
Hand & Power Tool Safety	x	x	x	x	x	x	x	x	x	x			x	x	x	
Hearing Conservation	x	x	x	x	x	x	x	x	x	x			x	x		
Ladder & Scaffolding Safety	x	x	x	x	x	x	x	x	x	x	x		x	x		
Office Safety	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Cultural Differences	x	x	x	x	x	x	x	x	x	x	x				x	x
Personal Protective Equipment	x	x	x	x	x	x	x	x	x	x			x	x		
Sexual Harassment	x	x	x	x	x	x	x	x	x	x	x					x
Slips, Trips, & Falls Prevention	x	x	x	x	x	x	x	x	x	x	x		x	x		
H.S. Diploma/GED	x	x	x	x	x				x		x	Certification/ Licenses				x
College Degree	x															x
Technical Degree		x	x	x	x											x
Electrical -Master/Journeyman				x												x
Plumbing -Master/Journeyman					x											x
HVAC Certificate			x													x
On-the-Job						x		x		x						x
Department Procedures	x	x	x	x	x	x	x	x	x	x	x	General Personnel Practices			x	
Work Practices - Time Management/Organization	x	x	x	x	x	x	x	x	x	x	x		x			x
Supervision	x	x							x							x
Employee Relations - Counseling, Performance Evaluation	x	x							x							x
Work Order System	x	x	x	x	x	x			x		x		x		x	x

SOURCE: Facility Engineering Associates (FEA).

FISCAL IMPACT

RECOMMENDATION	2009–10	2010–11	2011–12	2012–13	2013–14	5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
1. Hire Maintenance Director.	$0	$0	$0	$0	$0	$0	$0
2. Increase staffing levels.	($76,128)	($76,128)	($76,128)	($76,128)	($76,128)	($380,640)	$0
3. Implement an automated work order management system.	($1,700)	($1,700)	($1,700)	($1,700)	($1,700)	($8,500)	($950)
4. Implement a comprehensive maintenance program.	$0	$0	$0	$0	$0	$0	($15,100)
5. Formalize and document facilities planning and maintenance policies and procedures.	$0	$0	$0	$0	$0	$0	$0
6. Initiate a periodic facilities condition assessment.	$0	$0	$0	$0	$0	$0	($30,144)
7. Implement a comprehensive training program.	($6,000)	($6,000)	($6,000)	($6,000)	($6,000)	($30,000)	$0
TOTAL	**($83,828)**	**($83,828)**	**($83,828)**	**($83,828)**	**($83,828)**	**($419,140)**	**($46,194)**

VAN ALSTYNE INDEPENDENT SCHOOL INSTRUCTIONAL FACILITIES ALLOTMENT

While VAISD student enrollment grew by 80 students or 6 percent from 2003–04 through 2007– 08, the district is preparing for the rapid growth many districts in the area northeast of Dallas have experienced in the last five years. During the same period, taxable values have grown by $118,514,840 or 51.3 percent. **Exhibit 12** presents the enrollments and taxable values from 2003–04 through 2007–08.

Student growth is expected to remain constant. The most recent enrollment forecast projects an annual growth rate of more than 1.5 percent for the next 5 years. If this forecast is correct, the district enrollment will increase to 1,522 students in 2012–13.

VAISD uses a grade level configuration of pre-kindergarten, kindergarten—elementary through grade 4, intermediate—grades 5 and 6, middle school—grades 7 and 8, and high school—grades 9 through 12. The district houses each grade level configuration in a separate campus, except for the intermediate and middle schools which share a campus.

Exhibit 13 presents the capacity of each grade level configuration after the 2007 bond program and the projected enrollment for 2012–13. Based on this configuration, the district will provide capacity for forecasted enrollment growth upon completion of the projects.

VAISD undertook a capital improvement plan funded by bonded indebtedness to upgrade existing facilities and to provide additional facilities for the students and anticipated growth. In 2000, the voters passed an $18.5 million bond proposition to fund a new high school, athletic facilities and renovations to existing facilities. The voters passed a $13.5 million bond proposition in May 2007 to fund a new stadium, new band hall for the high school, major renovations to the intermediate/middle school and renovations to existing facilities. **Exhibit 14** presents the original budgets for the projects in the 2007 bond program.

Construction costs have increased significantly in the last two years due to demand for a variety of products used in the construction of buildings. VAISD had included inflation in the budget for the projects, but the actual construction costs for some of the projects as designed were above budget. VAISD was able to reduce cost of the projects by modifying the designs without significantly altering the projects. **Exhibit 15** presents the budgets for the 2007 bond and the cost of construction.

VAISD uses competitive sealed proposals (CSP) and the construction manager at risk (CMR) methods to construct buildings and complete renovations to existing facilities. The district used the CSP method to build the new stadium and the CMR method to build the band hall and renovate existing facilities. The district negotiated a CMR fee of 3.08 percent

EXHIBIT 12
VAN ALSTYNE ISD ENROLLMENTS AND TAXABLE VALUES
2003–04 THROUGH 2007–08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	2007–08
Enrollment	1,335	1,369	1,381	1,394	1,415
Taxable Value	$231,054,798	$269,034,475	$297,428,296	$322,172,455	$349,569,638

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 13
VAN ALSTYNE ISD PROJECTED ENROLLMENT AND CAPACITY
2012–13

GRADE LEVEL CONFIGURATION	PROJECTED ENROLLMENT	STATED CAPACITY	REMAINING CAPACITY
Pre-Kindergarten Center	11	160	149
Elementary School	508	550	42
Intermediate and Middle School	493	575	82
High School	510	550	40
TOTAL SCHOOLS	**1,522**	**1,835**	**313**

SOURCE: Van Alstyne ISD, Facilities Projection, May 2008.

EXHIBIT 14
VAN ALSTYNE ISD 2007 BOND PROGRAM
MAY 2008

PROJECT	BOND BUDGET
High School Athletic Stadium	$6,238,002
High School Additions and Renovations	$1,523,600
Middle School Renovations	$1,833,085
Intermediate School Renovations	$101,675
Middle School Gym Addition	$1,800,000
South College Campus Renovations	$470,875
Fees	$718,034
Contingency	$299,181
Cost Escalation	$515,548
TOTAL	**$13,500,000**

SOURCE: Van Alstyne ISD, Construction Documents, May 2008.

of construction costs for the construction manger and a 2.8 percent of construction costs for indirect costs which are included in the construction budget.

The district negotiated a fee structure with the architect based on a percentage of the cost of the construction for new designs of 6 percent of the cost. The district negotiated a payment schedule for the architectural services that reflects certain benchmarks in the design and construction process (**Exhibit 16**) that reflects industry standards.

The district negotiated a pricing structure with the financial advisor that is dependent on the amount of bonds the district issues, as do many districts. The fee is based on a set amount for a range of bonds plus an amount per $1,000 above the base of the range (**Exhibit 17**).

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 state's EDA 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 program operates without applications, has no award cycles and is available only to repay bonded debt. It is also intended to help fund debt related to both instructional and non-instructional facilities.

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

VAISD levied a $0.31 tax rate per hundred dollars valuation in 2007–08 to pay the district's debt service payments. In 2007–08, the district budgeted $498,000 in EDA funding and in IFA funding to assist in making the district's debt service payments. The IFA funding received by VAISD is from the Round 5 (June 2000) and Round 6 (June 2002) application cycles and is received by VAISD until the bonds are paid in full. The district applied for IFA but did not receive IFA funding from Round 7 (June 2004) of $184,833. **Exhibit 18** presents the I&S tax rate, taxable values and a calculated tax levy for VAISD from 2003–04 through 2007–08.

VAISD received more local revenue (**Exhibit 19**) than 100 percent of the calculated I&S levy (**Exhibit 18**) from 2003–04 through 2006–07 due to a high collection percentage, penalties and interest and investment interest. In 2007–08, VAISD has budgeted $1,148,278 in local revenues which is more than the tax levy of $1,083,666. In addition, VAISD has received the IFA (Rounds 5 and 6) and EDA funding to assist in the payment of debt service. **Exhibit 19** presents the debt service fund expenditures and revenue for 2003–04 through 2007–08.

EXHIBIT 15
VAN ALSTYNE ISD 2007 BOND PROGRAM CONSTRUCTION
MAY 2008

PROJECT	BOND CONSTRUCTION BUDGET	ACTUAL CONSTRUCTION COST
Stadium Complex	$6,511,265	$6,593,014
Additions and Renovations	$6,234,552	$6,221,288
TOTAL	**$12,745,817**	**$12,814,302**

SOURCE: Van Alstyne ISD, Construction Documents, May 2008.

EXHIBIT 16
VAN ALSTYNE ISD ARCHITECTURE FEES PAYMENT SCHEDULE
MAY 2008

PHASE	PERCENTAGE PAYABLE
Schematic Design	15%
Design Development	20%
Construction Document	40%
Bidding or Negotiation	5%
Construction	20%

SOURCE: Van Alstyne ISD, 2007 Architect Contract, May 2008.

IMPACT

VAISD reported that not receiving IFA had no direct impact on the capital improvement plan, because the district did not anticipate receiving IFA funding in Round 7. VAISD only included local revenues and EDA funding in developing the 2007 bond proposals. However, in order to fund the proposals without IFA assistance, the district used multiple bond sales and a higher I&S tax rate.

VAISD issued the authorized bonds in two sales in order to time the receipt of the proceeds with the start of the projects and reduce interest costs and required debt payments. The district issued the bonds in 2007 and 2008. The district incurred issuance costs that aggregated more than the costs associated with a single bond issue; however, the district saved interest costs with the separate issues.

EXHIBIT 17
VAN ALSTYNE ISD FINANCIAL ADVISOR FEES SCHEDULE
MAY 2008

MORE THAN	AND NOT MORE THAN	BASE FEE	ADDITIONAL AMOUNT
$100,000	$1,000,000	$7,500	$13.50 per $1,000 over $100,000
$1,000,000	$5,000,000	$19,650	$5.00 per $1,000 over $1,000,000
$5,000,000	$10,000,000	$39,650	$2.50 per $1,000 over $5,000,000
$10,000,000	$20,000,000	$52,150	$2.00 per $1,000 over $10,000,000
$20,000,000	No Limit	$72,150	$1.00 per $1,000 over $20,000,000

SOURCE: Van Alstyne ISD, 2007 Financial Advisor Contract, May 2008.

EXHIBIT 18
VAN ALSTYNE ISD INTEREST & SINKING (I&S) TAX RATE, TAXABLE VALUES AND I&S TAX LEVY
2003–04 THROUGH 2007–08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	2007–08
Tax Rate	$0.28000	$0.26000	$0.29000	$0.32000	$0.31000
Taxable Values	$231,054,798	$269,034,475	$297,428,296	$322,172,455	$349,569,638
Tax Levy	$646,953	$699,490	$862,542	$1,030,952	$1,083,666

SOURCE: Van Alstyne ISD, Superintendent, CPTD Taxable Values, Calculation by Consultant, May 2008.

EXHIBIT 19
VAN ALSTYNE ISD DEBT SERVICE FUND
2003–04 THROUGH 2007–08

DESCRIPTION	2003–04	2004–05	2005–06	2006–07	BUDGET 2007–08
Debt Payments	$1,260,234	$1,520,684	$1,575,908	$1,574,984	$1,646,278
State Funding	$652,875	$641,498	$596,358	$549,355	$498,000
Local Revenue	$678,744	$737,475	$914,753	$1,096,704	$1,148,278

SOURCE: Van Alstyne ISD and Texas Education Agency, Annual Audit Reports, 2007–08 Budget, May 2008.