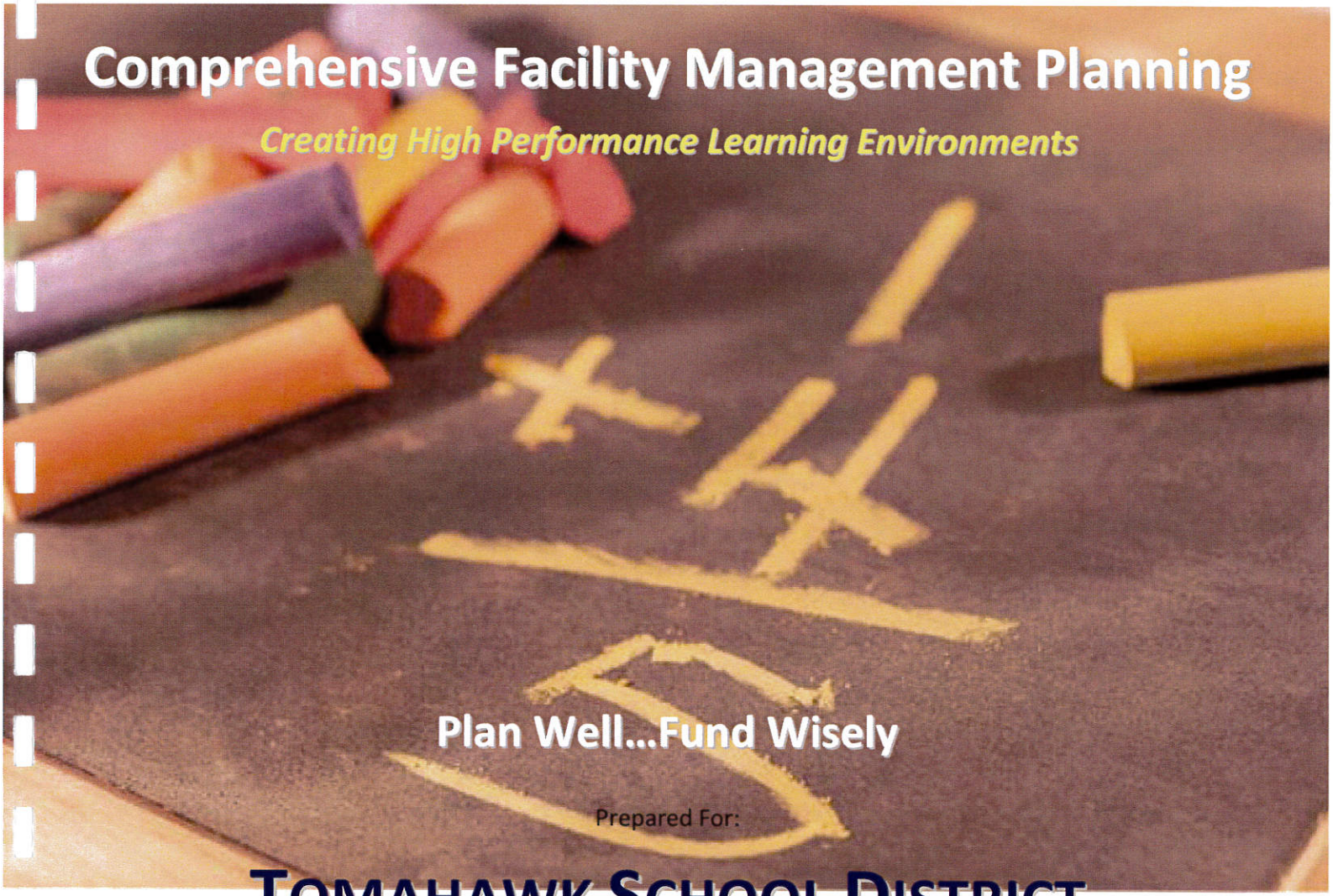
Preliminary Facility Analysis Report



Comprehensive Facility Management Planning

Creating High Performance Learning Environments

Plan Well...Fund Wisely

Prepared For:

TOMAHAWK SCHOOL DISTRICT

Prepared by:

ESG energy services group

1511 W. Main Ave De Pere, WI 54115

September 2014

Comparable Experience with Other K-12 Schools

ESG has worked extensively with over 100 K-12 districts throughout the Midwest including Minnesota, Wisconsin, Iowa, South and North Dakota developing and implementing comprehensive energy management plans. For some companies, K-12 schools are only a small segment of their business, and they attempt to be all things to all people. By focusing all our efforts on public education and public entities, we have a keen understanding of the unique challenges you face. Likewise, we have developed the skill sets and resources specific to your needs: specialists in school finance, engineers, and other technical experts that work exclusively with upgrading existing educational facilities and making them meet today's exacting standards plus a host of consulting partners and resources that make ESG ***THE*** leaders in developing, funding, and implementing comprehensive energy management plans. All of our customers become references, as we don't consider a job is complete until the customer agrees we have "under promised and over delivered".

> "We were very pleased with the work that ESG did on our school projects. They assisted us in the financing, design, and completion of the projects that were completed on time and within budget. Our facilities are operating efficiently & comfortably and are well equipped to serve our communities far into the future thanks to the work of ESG."
>
> Kelly D. Smith, Superintendent
> Belle Plaine Public Schools, ISD 716

Experience with Wisconsin Department of Public Instructions

We have extensive experience working collaboratively with Wisconsin Department of Public Instruction districts and the Wisconsin Department of Public Instruction to arrange for funding/financing of facility upgrade projects through the use of the Alternative Facilities Bonding and Revenue Limit Exemption, and Health and Safety projects to name a few. We have a thorough understanding of the requirements, limitations, and expectations of DPI in utilizing the programs they have available to school districts. In fact, ESG has a 100% success rate helping schools receive Review and Comment approval from DPI. Our unmatched resources combine technical and financial skills with this thorough understanding of DPI's requirements to customize a comprehensive facility management plan that is ***actionable***.

General Firm Information

ESG is a premier **"fee for service"** engineering and professional services firm that specializes in addressing the unique needs of existing K-12 buildings. ESG was formed specifically to provide solutions for the many energy and facility management challenges facing this public sector. Energy Services Group has the financial and technical resources available to help Tomahawk Schools maximize facility efficiency while enhancing the learning environment. We offer Tomahawk Schools' stakeholders the opportunity to assess and develop a Comprehensive Energy/Facility Management Plan that will:

Executive Summary

Ultimately, as stakeholders in Tomahawk Schools District, your goal is to envision Tomahawk School District's future, to establish priorities, and to develop a plan for achieving those objectives. **We can assist.**

We have assembled a team with unique qualifications in the arena of facility modernization. It would be our intent to implement an "integrated planning" approach at Tomahawk Schools; we would link Academic, Strategic, and Physical Planning. We would use resources wisely, to work collaboratively, to innovate and do what is uniquely right for Tomahawk Schools, as opposed to the "cookie cutter approach" applied by many in our industry. We have worked with other districts with similar characteristics to those of Tomahawk Schools.

This preliminary facilities analysis report outlines a process for improving the comfort, operations, and energy efficiency of Tomahawk Schools' facilities. This report is based upon ESG's proven methods and procedures, which deliver value, client satisfaction and promote proven long-term relationships. Simply stated, "We help our education clients improve their facilities learning and operating environment by determining what needs to be done, how to do it and how to fund it."

We have organized your preliminary facilities analysis report into the following sections:

- Facilities Planning and Optimization
- ESG Qualifications and Capabilities
- Utility Profile
- Facility Operations Profile
- Facility Findings and Recommendations
- Financial Impact
- Comprehensive Facility Management Planning Process / Summary

With the help and insight of the district's personnel, ESG has conducted a preliminary analysis of the district's facilities and has reviewed the district's overall historical energy usage records. Based on this review we are confident there is an opportunity to deliver annual utility savings of between **$47,000 (15% reduction)** and **$78,000 (25% reduction),** or leveraged between **$716,000** (conservative) and **$2,406,300** (aggressive) over the WI statutory term for guaranteed savings contracts depending on a defined project district-wide.

During our review, we identified several energy/utility efficiency and facility improvement opportunities, including improvements to the lighting and electrical systems, heating, ventilation and air conditioning systems (HVAC) and indoor climate control systems. Many of these improvements will dramatically affect the learning environment (better comfort, better indoor air quality, better light levels, etc.) as added academic enhancements

The ***Financial Impact*** section of this report reveals that there is an opportunity to significantly reduce utility costs throughout your facilities while completing needed facility improvement projects, improving indoor air quality and potentially creating a ***positive cash flow***.

Presently, we are at the second step (of seven) in the progressive process to implementing a Comprehensive Facility Management Plan with Tomahawk School District. To proceed to the next step, Energy Services Group requests your approval of a ***Project Development Agreement (PDA)***. This will authorize Energy Services Group to continue in the process of developing a Comprehensive Facility Management Plan for your district. A sample agreement is provided in the ***Appendix*** section of this report.

We believe that our solution to modernizing your schools is your best chance to deal effectively and completely with aging/deteriorating facility infrastructure and the challenge of providing a student environment conducive to learning. With that in mind, consider a business-education partnership with ESG and place your students in an environment worthy of the quality education you provide.

Planning Objectives

Understanding the External Pressures Affecting Tomahawk Schools

Most (if not all) Wisconsin K-12 districts are faced with the constraints of reduced state aid and increased public sensitivity to local taxation. This fiscal environment presents revenue challenges, even for the best administrators and school boards...it's difficult to achieve your mission with fewer resources at your disposal. Administrators and school boards must find the delicate balance between expenses and revenue, and more specifically, between operational and capital needs. External pressures that affect districts across Wisconsin include:

- **Uncertain economic environment** (unemployment, decreasing tax base, etc.)
- **Delayed state aid** (property tax shift) creates cash flow considerations
- **Declining enrollment** due to reduced number of school age children
- **Competition** for students (open enrollment, college-level/PSEO, online learning, home schooling, private and charter schools, etc.)
- **Rising operational costs** (e.g. staff, utilities, maintenance, etc.)
- **State academic standards.**

Aligning With Your Strategic Objectives

ESG is has worked extensively with K-12 districts throughout the Midwest by developing, funding, and implementing comprehensive facility plans. For some companies, K-12 schools are only a small segment of their business, as they attempt to be all things to all people. We work all day, every day, with Wisconsin, Minnesota, Iowa, South and North Dakota K-12 education clients and have amassed a firm understanding of the unique concerns, issues, limitations, and challenges facing today's public education entities. By focusing all our efforts on education, ESG has a keen understanding of the unique challenges you face. Likewise, we have developed the skill set and resources specific to your needs: specialists in school planning, finance, engineering, and project management, along with other technical experts that work exclusively with educational facilities. The partner districts with whom we have worked have expressed strategic objectives such as:

Comprehensive Facility Planning - Helping Districts Overcome Challenges

Having worked with numerous Wisconsin School Districts, we at ESG have encountered a wide range of challenges that confront the administrators and school boards with whom we have worked. Some of the challenges we help overcome include:

- Facilities are not well suited to serve 21st century education (e.g. science labs, technology infrastructure, etc.)
- Capacity issues – not enough space and/or too much space (and in the wrong location)
- Decreasing revenue (⇩ state aid, ⇩ enrollments).
- Local taxpayers are overburdened ⇨ difficult to increase taxes.
- Cost cutting has reached limits.
- No long-term capital plan in place; limited in-house (planning) expertise.
- Aging, inefficient, and potentially unhealthy facilities infrastructure

the focus will be on "right-sizing" and "repurposing" while still innovating and supporting students in a technology infused, 21st Century learning and extracurricular environment

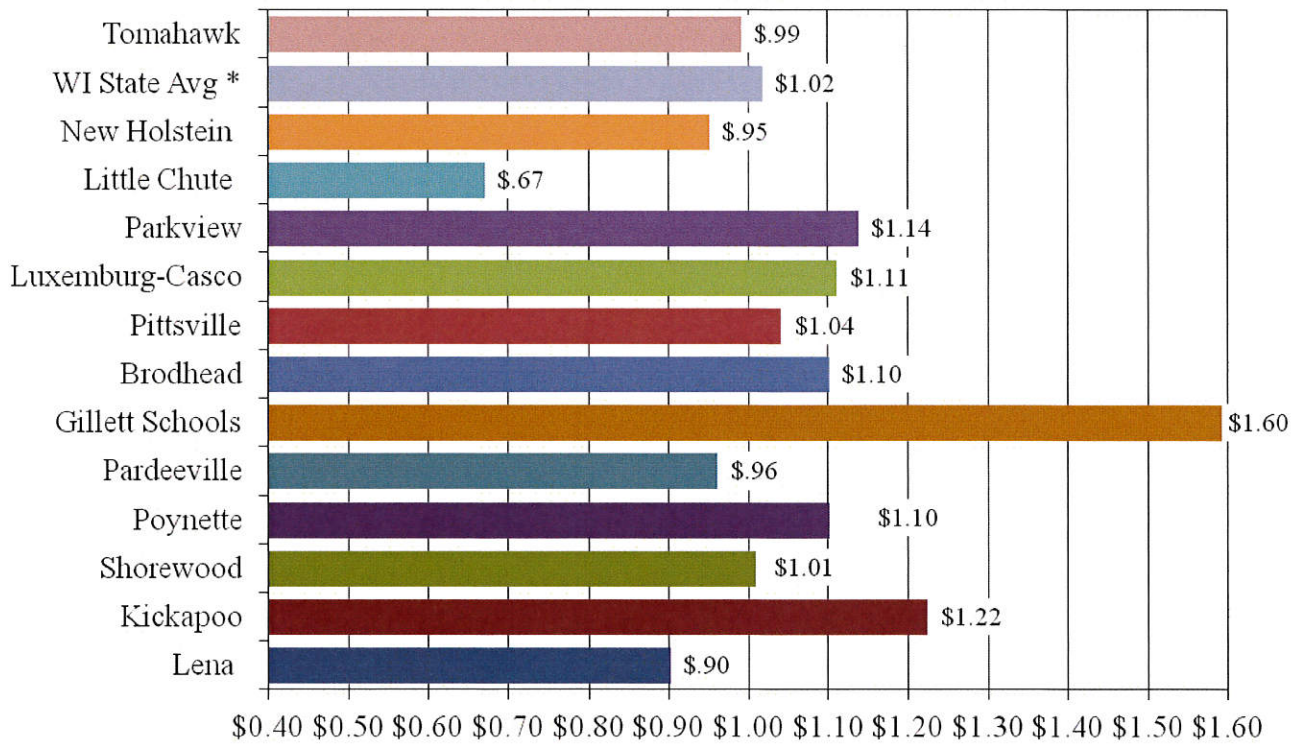
- Facilities are not well suited to serve 21st century education (e.g. science labs, technology infrastructure, etc.)
- Capacity issues – not enough space and/or too much space (and in the wrong location)

To overcome these (and many more challenges), ESG will help you develop, fund and implement a Comprehensive Facility Plan. As our company name implies, reducing your energy and operational expense is a large portion of what we do. However, a comprehensive approach will help you optimize your buildings for not only the present, but also provide the flexibility you need to change with the ever-evolving environment of education. We have developed the unique skill sets and proven methodology to help you evaluate your facilities, weigh and compare options, explore funding alternatives, and implement the best solution for your specific needs.

Utility Analysis

Total annual utility expenditures for Tomahawk Schools District were supplied by the District reflecting the period for fiscal year 2013-14. Based on the square footage for all facilities of 314,769 the profile we constructed results in an average annual utility per square foot cost of approximately $.99 per square foot.

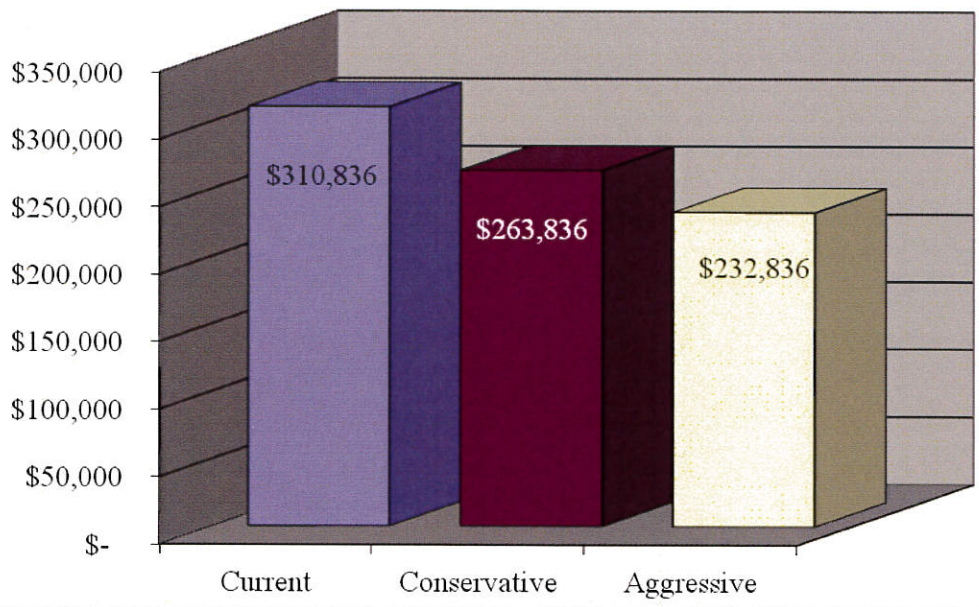
Utility Expense Benchmarking ($/Sq Ft)



2013-14 District Utility Consumption Monthly Breakdown

2013-14	Electric	Gas	Wtr/Swr	Total
July-13	$9,620	$2,278	$0	$11,898
August-13	$10,020	$2,252	$0	$12,272
September-13	$14,867	$3,255	$2,663	$20,786
October-13	$12,493	$6,658	$0	$19,152
November-13	$11,940	$9,977	$0	$21,917
December-13	$13,006	$15,185	$7,056	$35,248
January-14	$11,284	$21,797	$0	$33,080
February-14	$12,142	$29,212	$0	$41,354
March-14	$11,084	$33,013	$6,786	$50,883
April-14	$13,127	$10,375	$0	$23,502
May-14	$13,099	$5,503	$0	$18,602
June-14	$12,984	$2,234	$6,924	$22,142
Totals	$145,667	$141,739	$23,430	$310,836

Total Annual Utility Expenditures (Pre-retrofit vs. Post retrofit)



Financial Aspects

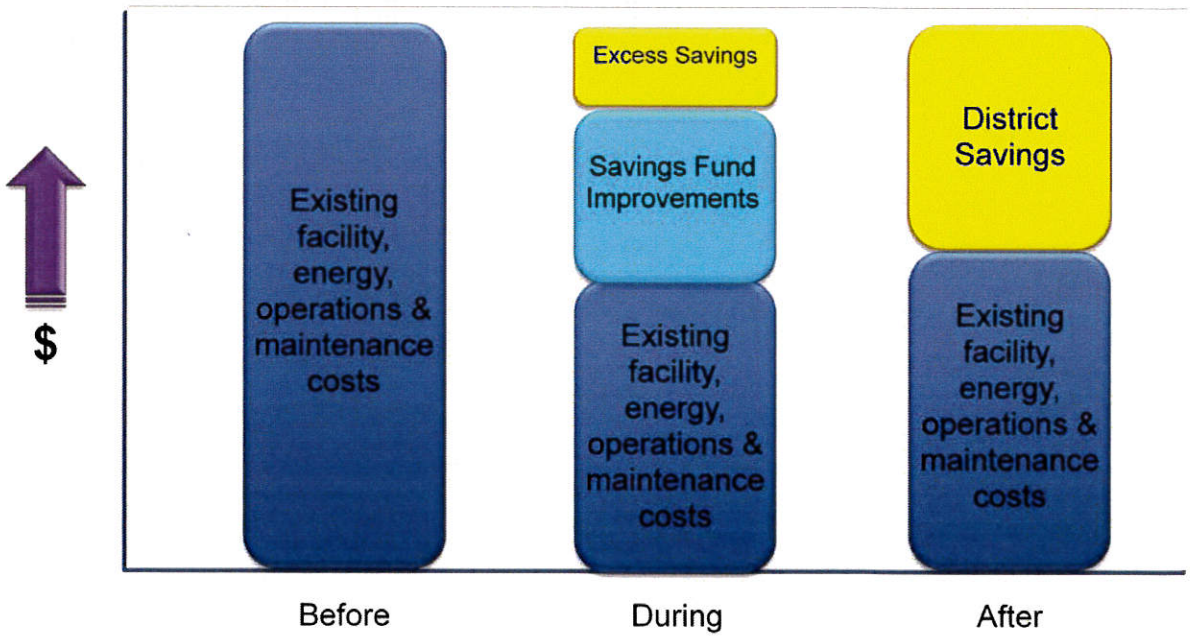
This section outlines financial projections based on the results of the preliminary energy and operational analysis performed at Tomahawk Schools' facilities. The purpose of this report is to present the opportunities identified during our preliminary analysis and to conservatively project the **potential financial impact** to the district.

This preliminary financial analysis includes ***energy conservation measures*** that will generate significant energy savings, which will pay for themselves over a relatively quick period. In addition, this analysis includes facility improvements identified by ESG such as ***ventilation improvements, deferred maintenance, capital improvements,*** and ***operational design deficiency opportunities***, which will have longer paybacks, but may be justified because of the resulting improvements to comfort, operations, equipment reliability, and/or extended equipment longevity.

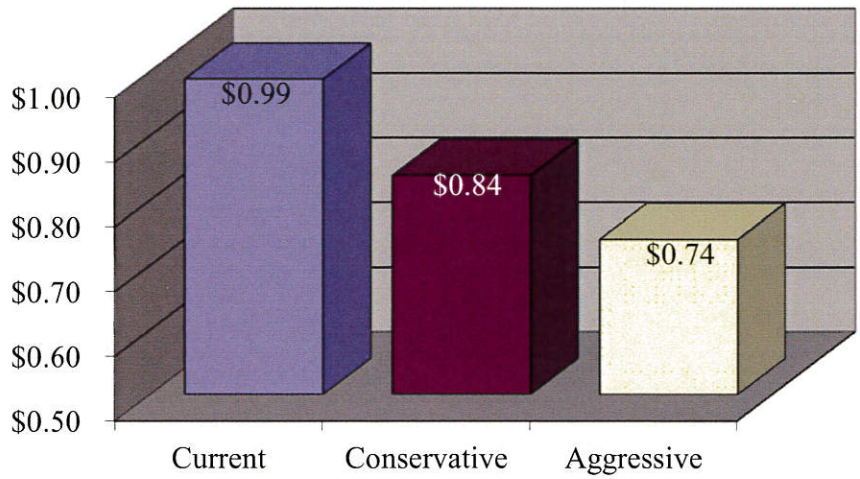
Therefore, the finance section of this preliminary report is intended to show that there is an opportunity to generate significant energy savings throughout Tomahawk facilities. In addition, there are other facility improvements that could be funded through a **Comprehensive Energy/Facility Management Plan** provided there are additional funds available to assist in paying for those improvements, such as through Health and Safety funding.

Finally, we have included multiple preliminary **cash flow analyses**. These are not intended to specify a particular project scope, but are included to demonstrate a potential project size and the representative cash flow analysis based solely on the preliminarily projected energy savings identified in this report.

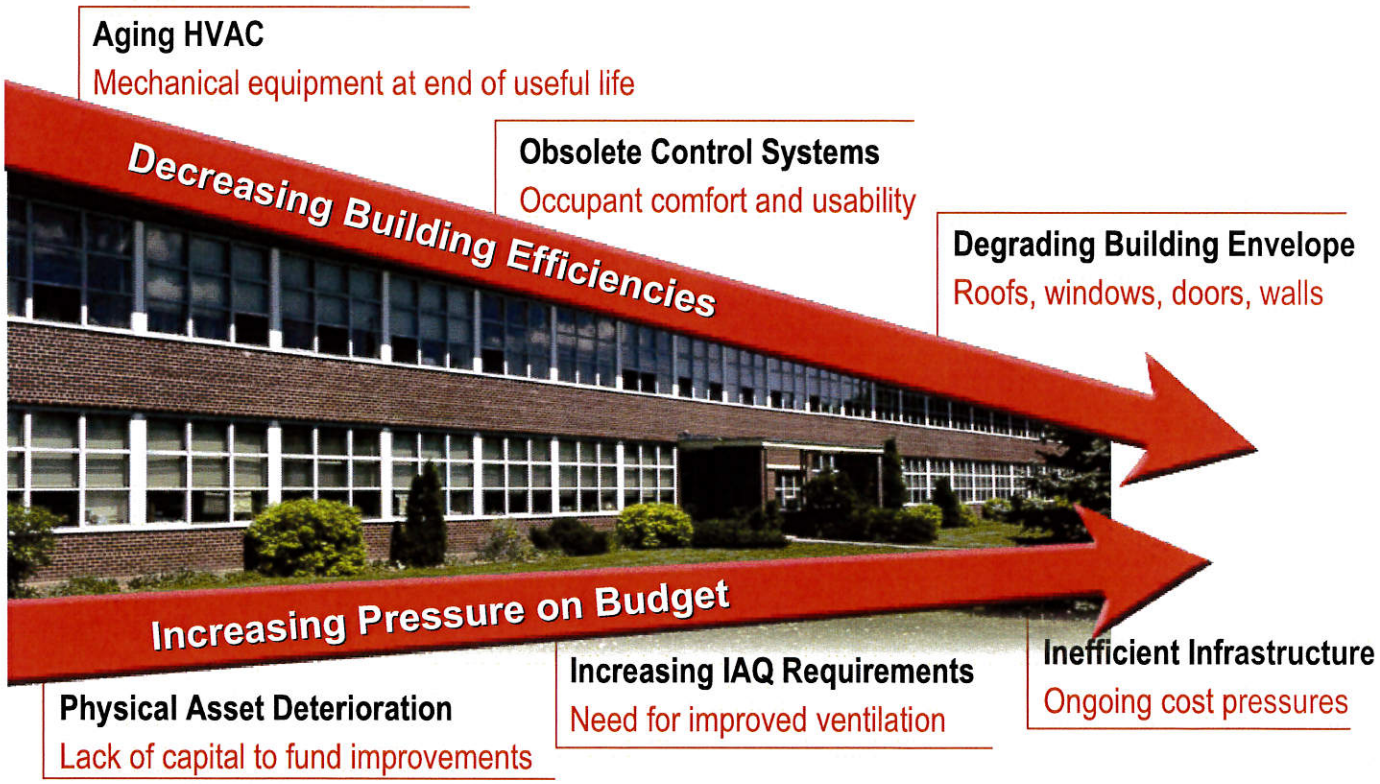
The Comprehensive Facility Management Plan Funding Concept



Overall Utility Costs ($/Square Foot) (Pre-retrofit vs. Post-retrofit)



Growing Challenges for Tomahawk Schools



Deferred Maintenance

Deferred maintenance is maintenance that was not performed when it should have been, that was scheduled and not performed, or that was delayed for a future budgeting period. Maintenance which is deferred because of insufficient funding may result in increased health and safety hazards, higher costs in the future and inefficient operations. The under-budgeting of regular maintenance accrues into a number of familiar needs of roof repairs, masonry repointing, and faulty HVAC and control systems, etc... These are familiar examples that accumulate into problems requiring major funding for correction.

Preliminary Findings and Recommendations

This section summarizes the notes and pictures taken during the July 24th, 2014 engineering walkthrough of the Tomahawk schools and conversations with Mike De Bels, Director of Buildings and Grounds. The buildings covered in this report include the Tomahawk High School, Middle School, and Elementary School covering approximately 314,769 square feet.

The Tomahawk facilities possess some potential for energy and operational savings improvements and are in need of some non-saving upgrades and enhancements. Detailed explanations of the existing conditions along with specific recommendations are provided on the following pages.

Utility Cost Savings Measures Code Definition

Each Facility Improvement Measure (FIM) has a code number that has been developed specifically for this project. The logic behind this number is:

The first character represents the FIM type:
A = Architectural (Blueprints, etc.)
C = Controls Systems
E = Electrical Systems
K = Kitchen Improvements
L = Lighting Systems
M = Mechanical Systems
M&V = Measurement and Verification
O&M = Operations & Maintenance
PL = Plumbing Systems
S = Structural (Envelope Systems)
U = Utility Service Systems
V = Ventilation Systems

→ **L.1** ←

The number represents the sequential order of that particular FIM type:

Controls and Energy/Facility Management Systems:

C.1 Energy Management and Direct Digital Controls

Existing Conditions:

The school district has an extensive Siemens energy management system (EMS) with direct digital controls (DDC) which control, monitor and schedule virtually all of the HVAC equipment within the district. All of the primary HVAC equipment; boilers, DX cooling, pumps and air handling units are DDC controlled. All of the zone control of reheat coils, perimeter radiation, and variable air volume boxes is also DDC controlled.

Recommendations:

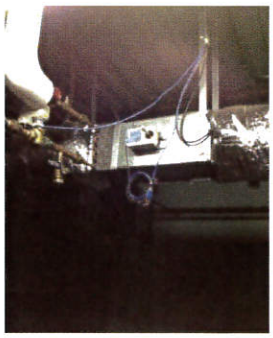
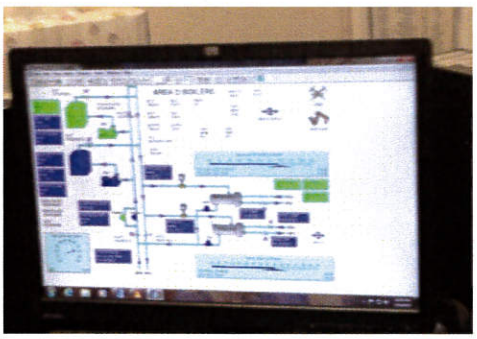
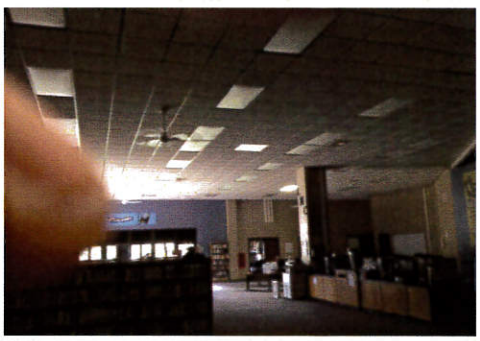
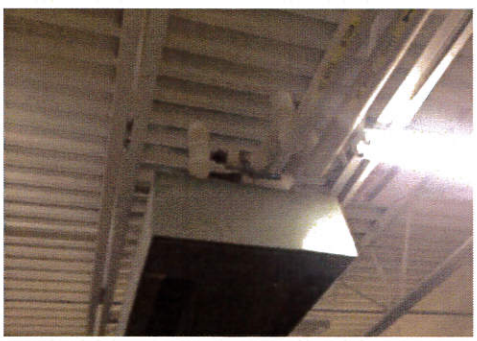
Expand the existing DDC control system to provide additional building control strategies. Provide new hardware points and software programming to the EMS system as per the following items:

- Evaluate HVAC system control based on new occupancy sensors in areas served by constant volume, single zone AHU's, with intermittent use, such as gyms, cafeterias, multi-purpose rooms and weight rooms.
- Tie various remaining exhaust fans, dishwasher booster heaters, domestic hot water heaters/ re-circulating pumps and exterior lighting systems into the existing energy management systems.

Re-commission all existing DDC points and optimize existing control strategies for energy efficiency. The following items would be included under this recommendation:

- Verify that outdoor dampers and exhaust fans stay closed or off, during unoccupied periods and morning warm-up periods, until actual occupancy periods.
- Optimize DDC set points for air handling units to reduce heating and cooling energy usage.
- Verify control strategy hardware and software operation, proper set points, and tuning of control loops.
- Tune control loops to eliminate hunting.
- Verify calibration of sensors and transducers recalibrate or replace as necessary.

	
Recommission the existing Andover Direct Digital Controls in each of the facilities.	Recommission the room controls and allow individual schedules to match actual occupancy.

	
Add occupancy sensors for areas with intermittent occupancy (classrooms, weight room, etc). HVAC systems will be controlled to provide comfort conditions based on whether the space is occupied.	Add CO2 sensors for areas with variable occupancy (auditorium, gymnasium, cafeteria, etc). Outdoor ventilation air dampers will be controlled to provide the required amount of ventilation air based on the actual occupancy.
	
Program VAV box operation to match schedules of spaces served. Add occupancy sensors for areas with varying usage.	Optimize boiler and hot water supply reset schedules for summer operation.
	
Add energy management control of the ceiling fans for more efficient operation.	Install an automatic control valve on the unit heater hot water coils which are currently uncontrolled.

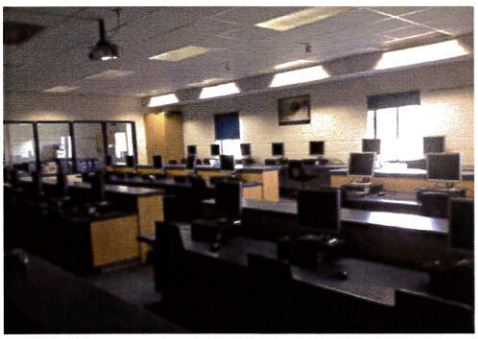
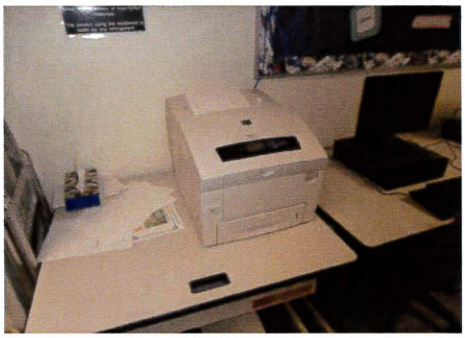
C.2 Install PC Power Management Software

Existing Conditions:

As the number of personal computers in your facility continues to grow, so does the cost of running them at full power, even when no one is using them. It is likely that one third or more of the energy your building expends on PCs is wasted because the computers remain in full power mode when they are not being used.

Recommendations:

Implement a network based software solution to remotely monitor and control the power settings of PCs and monitors in all buildings on campus. This software will allow user friendly, customized settings for power management, to reduce electrical energy usage, while allowing for off-hour software upgrades, backups and other network maintenance tasks.

	
Program power management strategies to shut down computer and monitors.	Evaluate use of software to manage printers and paper usage in the District. FILE PHOTO

Electrical Systems:

E.1 Motors and Variable Speed Drives – Air Handling Units and Pumps

Existing Conditions:

The school system has standard efficiency motors on some air handling units, exhaust fans and pumps that have sufficient operating hours to warrant changing the motors to premium efficiency motors. There are also several large, single zone air handling units which serve gyms, band rooms and multi-purpose rooms. These units are designed for maximum building occupancy and design ambient conditions that do not occur for the majority of the time that the systems operate.

Recommendations:

Install variable speed drives and controls to modulate the speed of any air handling units running constantly at full speed when appropriate. Heating and cooling energy savings will be realized by reducing the amount of outside air delivered by the air handling units. Energy consumption on motors is exponentially proportional to the motor speed; therefore savings associated with reducing motor speeds are also exponential. This would include:

- The fans will be programmed to meet heating, ventilating and cooling required conditions.
- The variable speed drives will be modulated to reduce ventilation during periods of low occupancy.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Replace older electric motors with high efficiency motors.</td><td>Replace the existing three way hot water coil control valves with two way valves to achieve additional heating pump variable speed drive savings.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Recommission the existing Elementary air handling unit variable speed drives to ensure maximum energy savings potential.</td><td>Investigate use of variable speed drives on air handling units that serve large areas with variable occupancy such as the field house.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Investigate installing a variable speed drive on the chilled water pump that serves the air cooled chiller.</td></tr>
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Currently the pump has the triple duty valve significantly closed for flow control.

E.2 Upgrade Older Electrical Panels

Existing Conditions:

There are other facility electrical systems that need upgrade or replacement.

Recommendations:

The following are examples of other electric system improvements:

	
Upgrade original fused electrical distribution panels to circuit breaker technology.	Upgrade original fused electrical distribution panels to circuit breaker technology.

Lighting Systems:

L.1 Lighting Retrofit

Existing Conditions:

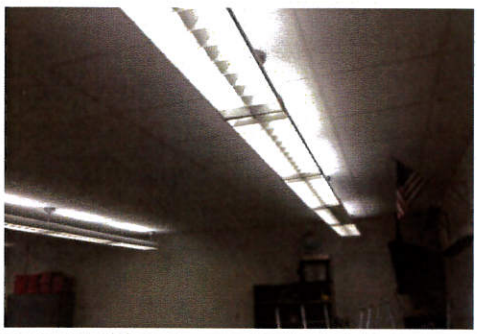
The interior lighting systems in the district are primarily efficient T8 electronically ballasted fluorescent fixtures. Some areas appear to be at higher light levels than required, especially classrooms with lay-in style flush fixtures. Some outdoor fixtures have not yet been converted from the original metal halide to LED technology.

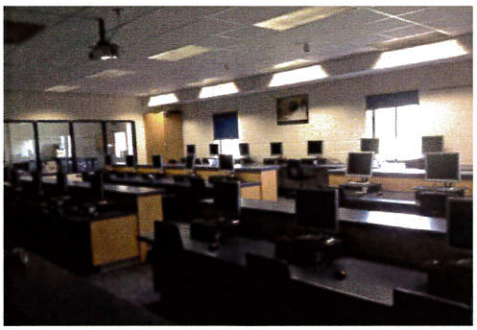
Recommendations:

There is an excellent opportunity to both improve the quality of lighting within the district as well as significantly reduce the energy and maintenance costs associated with the lighting system. Our general approach is to install a new high performance lighting system and reengineer light levels to recommended levels in order to provide the appropriate light levels for each space, with a high quality light, 5000 Kelvin lamps, in the most energy efficient manner. Long life (40,000 hr compared to 20,000 hr) T8 lamps and high performance electronic ballasts will be used. As part of the lighting retrofit we will utilize de-lamping, installation of high performance reflectors and low power ballasts as much as practical, to achieve the recommended post retrofit light levels.

The following specific recommendations are offered:

- Perform a comprehensive retrofit of all lighting fixtures utilizing high performance, extended life 5000k T8 lamps, reflector kits and high efficiency electronic ballasts to provide the recommended IES (Illuminating Engineering Society) light levels, for each specific area, in the most energy efficient manner.
- Utilize long life LED lamps to replace incandescent and compact fluorescent lamps
- Install occupancy sensors in gymnasiums, restrooms, conference rooms and other areas of intermittent use
- Consider retrofitting or replacing existing outdoor fixtures to LED technology

	
Retrofit existing fixtures, utilizing high performance components, to provide the recommended IES light levels, for areas that are currently over lit.	Replace existing inefficient "egg crate" style fixtures with new single lamp fluorescent fixtures.

	
Investigate daylight harvesting control of lighting in corridor areas with natural lighting from skylights.	Install occupancy sensors for classrooms and other areas with intermittent occupancy.
	
Investigate retrofitting existing wall mounted outdoor HID fixtures to LED technology.	Investigate retrofitting existing pole mounted outdoor HID fixtures to LED technology.

Mechanical Systems:

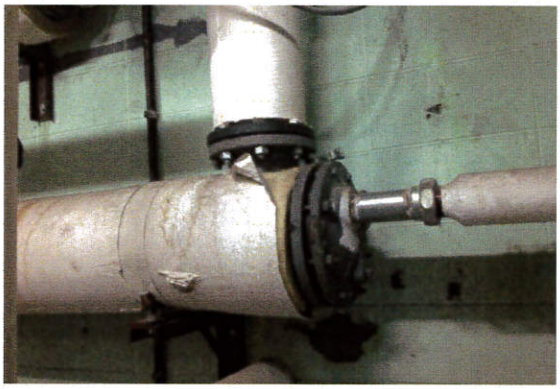
M.1 Valve, Pipe, and Accessory Insulation

Existing Conditions:

There are various areas throughout the buildings that have uninsulated heating system surfaces such as hot water piping. Most of these areas do not need additional heat and the radiated heat is wasted. In addition hot water fittings are typically left uncovered for maintenance access.

Recommendations:

This facility improvement measure involves installing new fiberglass pipe insulation with protective covering to uninsulated lines/tanks and new lace-up removable insulation covers over the hot water line fittings throughout the building.

	
Add insulation to hot water heat exchanger flanges.	Add insulation to uninsulated hot water system pump fittings.
	
Add insulation to uninsulated hot water system fittings.	Add insulation to the top of the infrared heater will improve the system efficiency.

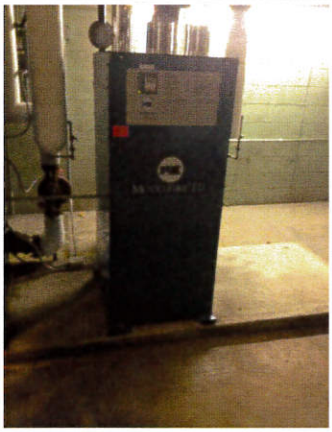
M.2 Heating System Improvements

Existing Conditions:

The heating system has two larger (6,000,000 BTU) Cleaver Brooks hot water boilers and two smaller (2,000,000 BTU) Patterson Kelley hot water boilers. The smaller boilers can handle the summer and shoulder month heating loads. The larger boilers do have cycling of the boiler burners to maintain smaller heating loads- especially during unoccupied periods.

Recommendations:

The following are recommendations for heating system improvements:

	
Install additional Patterson Kelley condensing boilers in parallel with the existing PK boilers. This will allow highly efficient summer operation and use of the smaller boiler system throughout the heating season.	The larger Cleaver Brooks boilers would be only for backup use if additional smaller boilers are added.

M.3 Kitchen System Upgrades

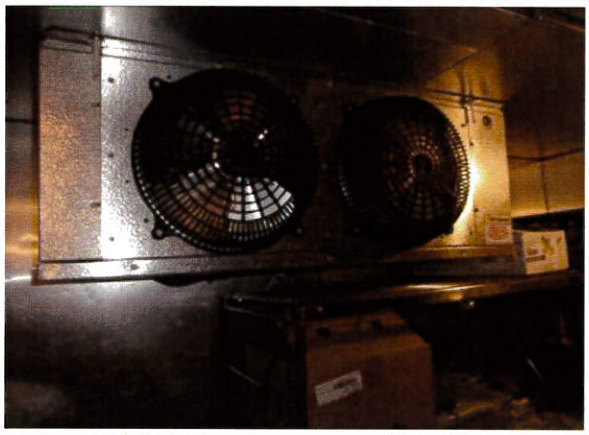
Existing Conditions:

There are opportunities to upgrade the efficiency of the kitchen dishwashing, ventilation, and refrigeration systems.

Recommendations:

The following are examples of various kitchen system upgrades:

	
Install a control system that varies the capacity of kitchen hood exhaust and makeup air systems based on cooking activity.	Convert the dishwasher booster heating from electrical energy to less expensive natural gas.

	
Provide energy modifications to kitchen cooler and freezer evaporating units. FILE PHOTO	Install humidity control to control the electric heaters on the freezer doors.

Plumbing Systems:

P.1 Water Efficiency Improvements:

Existing Conditions:

Water and sewer costs are a substantial cost within School Districts and are one of the fastest growing utility costs. Most of the plumbing fixtures within the district are using more water than is required for proper operation.

Recommendations:

Reduce domestic water usage by re-building or installing new flow control devices; flush valves, sink aerators and kitchen pre-wash sprayers. Water and sewer rates are fairly high within the City of Tomahawk. Plumbing improvements will have an attractive payback. The following are specific recommendations:

- **Flush Valves** - Rebuild existing flush valves with high performance materials and variable flow technology. Tune each flush valve to flush at the lowest flow, which provides good performance. The following scope is being proposed:

- **Sink Aerators** - Remove existing aerator (if applicable). Replace with new, vandal-proof flow control device with appropriate flow rate and pattern. Include appropriate adapter (if necessary) to ensure uniformity across the affected buildings.

- **Kitchen Sprayer Replacement** – Install new high efficiency pre-rinse spray valve.

	
Install aerators on sink faucets to reduce water consumption.	Ensure the proper volume of water is used for toilets/urinals, and make modifications if necessary.

	
Install proximity controls on flush valves. Calibrate existing flush control valves to reduce water consumption to the design levels.	Evaluate locker room shower upgrades for water saving efficiency.
	
Install individual flush controls on urinals which are controlled from a common flush valve.	Evaluate efficiency upgrades for pool water circulating system such as a variable speed drive which maintains constant flow as sand filters are loaded.

Structural Systems:

S.1 Building Envelope Improvements

Existing Conditions:

Most buildings have leakage of conditioned air through the building envelope; windows, doors, walls and roof. Any leakage results in wasted energy and can also cause discomfort where cold air may be leaking into the building. Currently areas of the building exterior are in need of tuck pointing.

Recommendations

We recommend a comprehensive building envelope survey to identify areas of infiltration and determine cost effective solutions to reduce the amount of infiltration and energy waste. Typically the following areas may be included:

- Weather-strip/caulk exterior doors and windows
- Inspect and seal the roof/wall intersection if accessible

- Seal mechanical and boiler rooms to prevent exhaust of conditioned air.
- Inspect and seal all roof penetrations.
- Evaluate building tuck pointing needs.
- Evaluate need to add building exterior expansion joints.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Weather strip exterior doors.</td><td>Seal the roof/wall joint to minimize infiltration.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Repair mortar joints on exterior brick.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Install new vertical expansion joints and repair vertical cracks on exterior brick.</td></tr>
</table>

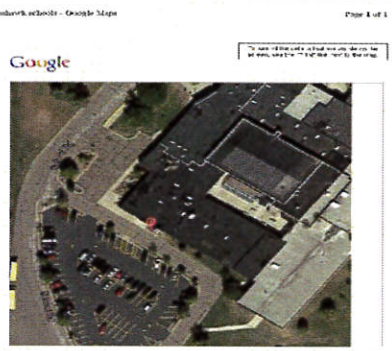
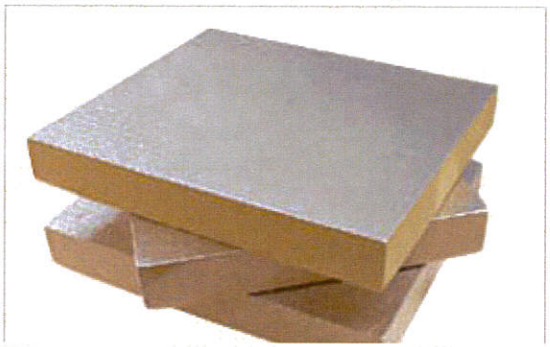
S.2 Building Envelope Improvements- Middle School Roof Replacement

Existing Conditions:

The roof over the Middle School has exceeded its useful life and is scheduled for replacement.

Recommendations

Replace the existing Middle School roof with a new roof with additional insulation:

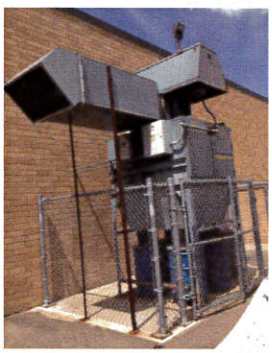
	
The existing Middle School roof needs replacement.	Add additional rigid insulation to the roof to improve energy efficiency.

Ventilation Systems

V.1 Ventilation System Upgrades

Description:
There are a variety of central air handling systems which provide heating, ventilation, and air conditioning to various areas of the facilities. Some of the systems were installed with the original construction phases and have exceeded their rated lifespan. As an example the original 1980 elementary school addition has air handling units in need of upgrading.

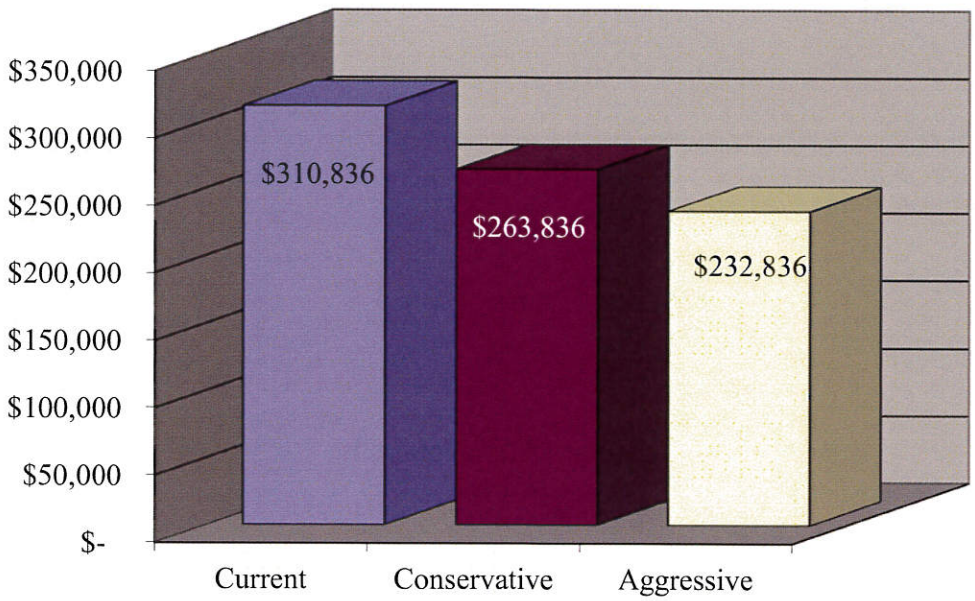
Recommendations:
This recommendation would retrofit and upgrade the older central air handling systems:

	
The original Elementary School air handling systems were installed in 1980 and have exceeded their rated lifespan. Investigate refurbishing the interior of the existing units to increase their rated life.	Investigate converting the existing dust collector to a recirculating air style.

Energy Savings Potential

Based on our preliminary analysis we estimate potential energy savings to between $47,000 a 15% reduction, and a $78,000 25% reduction of the annualized utility expenditures depending on the scope of the project. The following are graphic depictions of these savings:

Total Annual Utility Expenditures (Pre-retrofit vs. Post retrofit)



This graph compares Tomahawk Schools' current annual utility expenditures to potential future annual utility expenditures. This assumes the District implements either a conservative or aggressive ***Comprehensive Facility Management Plan*** *with ESG*

Tomahawk School District

Facility Improvement Measures Measures (FIM) Matrix

Facility Name	Scenario # 1	Scenario # 2	FIM Code	Facility Improvement Measure Description	Annual Savings			Rebates	Estimated Cost	Simple Payback
					Utility	Operationa	Total			
Tomahawk Schools			C	**Controls and Energy/Facility Management Systems**						
	X	X	C.1	- Energy Management and DDC Controls						
	X	X	C.2	- Install PC Power Management Software						
			E	**Electrical Systems**						
	X	X	E.1	- Motors and Variable Speed Drives - Air Handling Units and Pumps						
	X	X	E.2	- Upgrade Older Electrical Panels						
			L	**Lighting Systems**						
	X	X	L.1	- Lighting Improvements						
			M	**Mechanical Systems**						
	X	X	M.1	- Valve, Pipe, and Accessory Insulation						
	X	X	M.2	- Heating System Improvements						
		X	M.3	- Kitchen System Upgrades						
			O&M	**Operations and Maintenance - Deferred Maintenance**						
	X		O&M.1	- Miscellaneous Operations & Maintenance Repairs - Allowance						
		X	O&M.2	- Miscellaneous Operations & Maintenance Repairs - Allowance						
			PL	**Plumbing & Irrigation Systems**						
	X	X	P.1	- Plumbing Efficiency Improvements						
			S	**Structural Systems**						
	X	X	S.1	- Building Envelope Improvements						
	X	X	S.2	- Building Envelope Improvements - Middle School Roof Replacement						
			U	**Utility Systems**						
			U.1	- Utility System Improvements - Renewable Energy Sources						
			V	**Utility Systems**						
		X	V.1	- Ventilation System Upgrades						
	X			**Preliminary Project Summary - Scenario 1**	**$47,000**	**$14,100**	**$61,100**	**$16,450**	**$733,200**	**11.7**
		X		**Preliminary Project Summary - Scenario 2**	**$78,000**	**$23,400**	**$101,400**	**$27,300**	**$2,433,600**	**23.7**

Total GSF 327,135

Tomahawk Schools Preliminary Cash Flow Analysis

Scenario #1 - Conservative Project

CAPITAL INVESTMENT	$ 733,200
Rebates	$ (16,450)
NET INVESTMENT FINANCED	$ 716,750

YEARS	PROJECT FUNDING				PROJECT COST			CASH FLOW ANALYSIS	
	Utility Savings	Operational Savings	Limit Exemption	Total Savings	Financing Costs	Technical Services	Total Annual Project Cost	Annual Savings	Cumulative Savings
Year 1	$ 47,000	$ 14,100	$ -	$ 61,100	$ (62,354)	$ (2,500)	$ (64,854)	$ (3,754)	$ (3,754)
Year 2	$ 48,410	$ 14,523	$ -	$ 62,933	$ (62,354)	$ (2,575)	$ (64,929)	$ (1,996)	$ (5,749)
Year 3	$ 49,862	$ 14,959	$ -	$ 64,821	$ (62,354)	$ (2,652)	$ (65,006)	$ (185)	$ (5,934)
Year 4	$ 51,358	$ 15,407	$ -	$ 66,766	$ (62,354)	$ (2,732)	$ (65,085)	$ 1,680	$ (4,254)
Year 5	$ 52,899	$ 15,870	$ -	$ 68,769	$ (62,354)	$ (2,814)	$ (65,167)	$ 3,601	$ (652)
Year 6	$ 54,486	$ 16,346	$ -	$ 70,832	$ (62,354)	$ (2,898)	$ (65,252)	$ 5,580	$ 4,928
Year 7	$ 56,120	$ 16,836	$ -	$ 72,957	$ (62,354)	$ (2,985)	$ (65,339)	$ 7,618	$ 12,545
Year 8	$ 57,804	$ 17,341	$ -	$ 75,145	$ (62,354)	$ (3,075)	$ (65,428)	$ 9,717	$ 22,263
Year 9	$ 59,538	$ 17,861	$ -	$ 77,400	$ (62,354)	$ (3,167)	$ (65,520)	$ 11,879	$ 34,142
Year 10	$ 61,324	$ 18,397	$ -	$ 79,722	$ (62,354)	$ (3,262)	$ (65,615)	$ 14,106	$ 48,248
Year 11	$ 63,164	$ 18,949	$ -	$ 82,113	$ (62,354)	$ (3,360)	$ (65,713)	$ 16,400	$ 64,648
Year 12	$ 65,059	$ 19,518	$ -	$ 84,577	$ (62,354)	$ (3,461)	$ (65,814)	$ 18,763	$ 83,410
Year 13	$ 67,011	$ 20,103	$ -	$ 87,114	$ (62,354)	$ (3,564)	$ (65,918)	$ 21,196	$ 104,606
Year 14	$ 69,021	$ 20,706	$ -	$ 89,727	$ (62,354)	$ (3,671)	$ (66,025)	$ 23,703	$ 128,309
Year 15	$ 71,092	$ 21,328	$ -	$ 92,419	$ (62,354)	$ (3,781)	$ (66,135)	$ 26,284	$ 154,593

Escalation 3.0%

Sources of Financing	Interest Rate		Years	Amount
Third Party Financing	3.75%		15	$ 716,750

Tomahawk Schools Preliminary Cash Flow Analysis

Scenario #2 - Aggressive Project with Revenue Limit Exemption

CAPITAL INVESTMENT	$ 2,433,600
Rebates	$ (27,300)
NET INVESTMENT FINANCED	$ 2,406,300

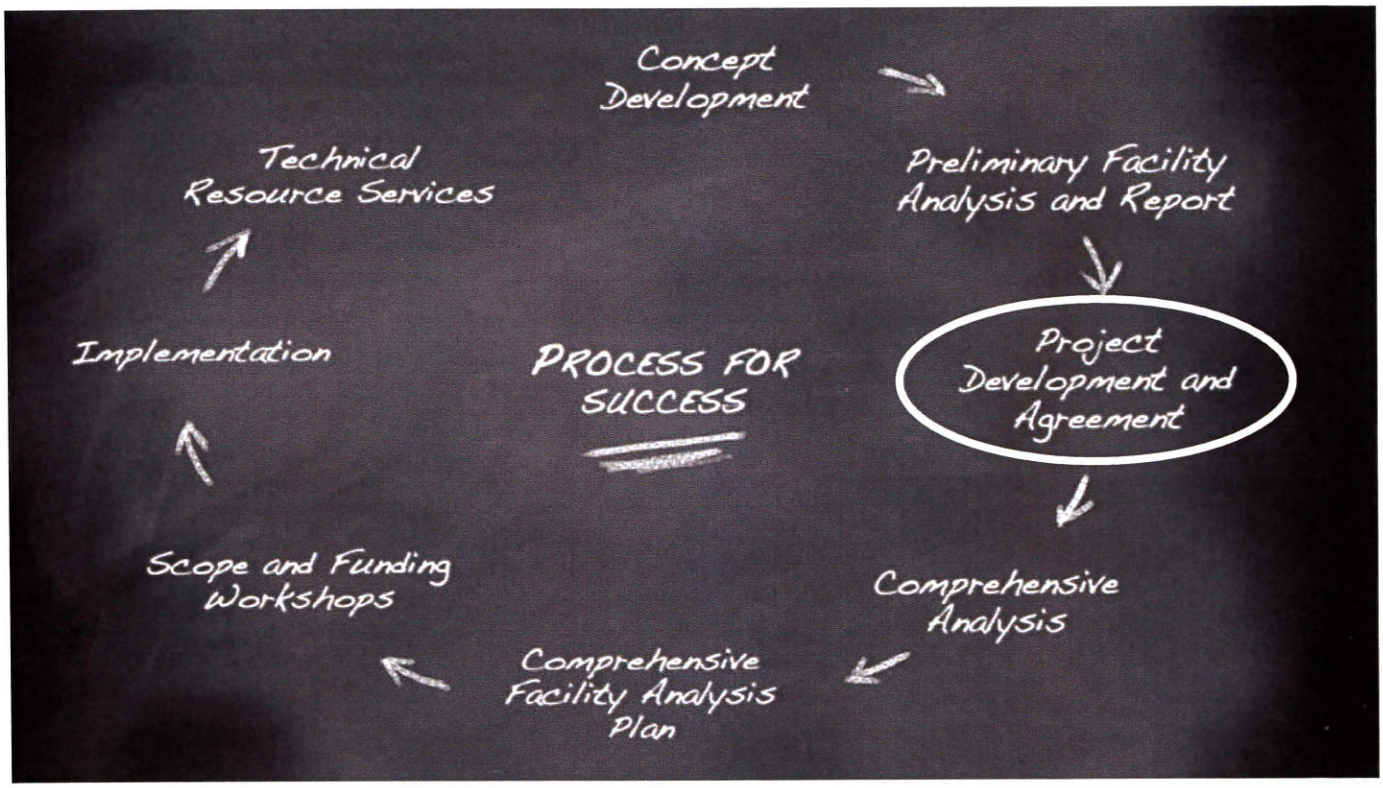
YEARS	PROJECT FUNDING				PROJECT COST			CASH FLOW ANALYSIS	
	Utility Savings	Operational Savings	Revenue Limit Exemption	Total Savings	Financing - Revenue Limit Exemption	Technical Services	Total Annual Project Cost	Annual Savings	Cumulative Savings
Year 1	$ 78,000	$ 23,400	$ 80,499	$ 181,899	$ (174,399)	$ (7,500)	$ (181,899)	$	$
Year 2	$ 80,301	$ 24,090	$ 77,729	$ 182,120	$ (174,399)	$ (7,721)	$ (182,120)	$	$
Year 3	$ 82,670	$ 24,801	$ 74,877	$ 182,348	$ (174,399)	$ (7,949)	$ (182,348)	$	$
Year 4	$ 85,109	$ 25,533	$ 71,941	$ 182,583	$ (174,399)	$ (8,184)	$ (182,583)	$	$
Year 5	$ 87,619	$ 26,286	$ 68,919	$ 182,824	$ (174,399)	$ (8,425)	$ (182,824)	$	$
Year 6	$ 90,204	$ 27,061	$ 65,807	$ 183,073	$ (174,399)	$ (8,673)	$ (183,073)	$	$
Year 7	$ 92,865	$ 27,860	$ 62,604	$ 183,328	$ (174,399)	$ (8,929)	$ (183,328)	$	$
Year 8	$ 95,605	$ 28,681	$ 59,306	$ 183,592	$ (174,399)	$ (9,193)	$ (183,592)	$	$
Year 9	$ 98,425	$ 29,527	$ 55,911	$ 183,863	$ (174,399)	$ (9,464)	$ (183,863)	$	$
Year 10	$ 101,329	$ 30,399	$ 52,415	$ 184,142	$ (174,399)	$ (9,743)	$ (184,142)	$	$
Year 11	$ 104,318	$ 31,295	$ 48,817	$ 184,430	$ (174,399)	$ (10,031)	$ (184,430)	$	$
Year 12	$ 107,395	$ 32,219	$ 45,112	$ 184,726	$ (174,399)	$ (10,326)	$ (184,726)	$	$
Year 13	$ 110,563	$ 33,169	$ 41,298	$ 185,030	$ (174,399)	$ (10,631)	$ (185,030)	$	$
Year 14	$ 113,825	$ 34,147	$ 37,371	$ 185,344	$ (174,399)	$ (10,945)	$ (185,344)	$	$
Year 15	$ 117,183	$ 35,155	$ 33,329	$ 185,667	$ (174,399)	$ (11,268)	$ (185,667)	$	$
Year 16	$ 120,640	$ 36,192	$ 29,168	$ 185,999	$ (174,399)	$ (11,600)	$ (185,999)	$	$
Year 17	$ 124,198	$ 37,260	$ 24,883	$ 186,341	$ (174,399)	$ (11,942)	$ (186,341)	$	$
Year 18	$ 127,862	$ 38,359	$ 20,473	$ 186,694	$ (174,399)	$ (12,294)	$ (186,694)	$	$
Year 19	$ 131,634	$ 39,490	$ 15,932	$ 187,056	$ (174,399)	$ (12,657)	$ (187,056)	$	$
Year 20	$ 135,517	$ 40,655	$ 11,257	$ 187,430	$ (174,399)	$ (13,031)	$ (187,430)	$	$

Escalation 3.0%

Sources of Financing	Interest Rate	Years	Amount
Financing - Revenue Limit Exemption	4.00%	20	$ 2,406,300

Facility Management Planning Process

Energy Services Group will use the following approach for developing and implementing a Comprehensive Facility Management Plan for Tomahawk Schools:



Preliminary Facility Analysis ✓

ESG has performed a preliminary energy and operational analysis of your facilities. ESG has identified some potential facility improvement measures and energy conservation opportunities. ESG has also demonstrated some potential cash flow scenarios to fund these improvements. This report is the result of this analysis.

Project Development Agreement

The next step in the process is for Tomahawk Schools to approve the concept of developing a Comprehensive Facility Management Plan for the district. Issuing Energy Services Group a **Project Development Agreement** will authorize us to commence with a Comprehensive Facility Analysis of the district's facilities.

A sample Project Development Agreement is included for your review in the Appendix section.

Comprehensive Facility Analysis and Plan

ESG will perform a comprehensive and detailed energy and operational analysis of your facilities. ESG will work closely with school personnel to identify and validate facility improvement needs and energy conservation opportunities. In addition, energy and operational savings and project costs will be identified. Supply-side savings strategies will also be refined such as the opportunities for direct purchase of natural gas and/or electricity and improved rate structures.

Scope and Funding Workshop(s)

ESG will facilitate project development workshops where ESG will work with school stakeholders to review facility improvement needs and energy conservation opportunities and their respective costs and savings. Together, ESG and the district will assess the costs and benefits of each improvement and collectively develop the scope and implementation strategies for the Comprehensive Facility Management Plan.

ESG will facilitate workshops where ESG will work with the district to identify and evaluate all funding and financing alternatives. Together, ESG and Tomahawk Schools' decision makers will assess all options and determine the most cost-effective funding and financing approach for implementing the districts Comprehensive Facility Management Plan.

Project Implementation

Upon project and financing approval, the implementation of the Comprehensive Facility Management Plan will commence. The implementation will include final design and engineering documentation of the selected facility improvements, award of installation subcontracts, management of subcontractors, training of school personnel, final commissioning, and approval of the installations. Concurrently, natural gas and/or electricity delivery contracts and/or utility negotiations will be consummated where pertinent.

Technical Resource Services

Upon completion of the installation of the facility improvements, ESG may provide ongoing services including energy reporting, on-going facility monitoring and annual guaranteed savings reconciliation. In addition, any district requested annual commissioning services and training programs would begin and continue on an ongoing basis.

Summary

To proceed, we request that you adopt the concept of implementing a **Comprehensive Facility Management Plan** at Tomahawk Schools. The next step in the process is for the district to determine the scope of the comprehensive energy and operational analysis and issue a Project Development Agreement authorizing us to proceed with the analysis (see sample Project Development Agreement in the Appendix).