

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

This information is proprietary and confidential

FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
1.01-BES	Lighting (All)	In the high ceiling areas there are pendant mounted metal halide fixtures. In the other areas there is a mixture of T12 lighting and T8 lighting.	The proposed solution would be to replace the metal halide fixtures with fixtures that use T-5 lamps, and replace all the T12 with T8 fixtures and electronic ballasts.	Bellevue ES	\$53,700	\$65,000	\$1,670	\$2,060	\$497	\$7,500	\$46,200	\$57,500	5%	30%	62%
1.02-BES	Lighting Controls	The lighting controls are currently all manual light switches.	Each classroom should be retrofitted with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Bellevue ES	\$24,000	\$29,000	\$620	\$770	\$0	\$2,400	\$21,600	\$26,600	-12%	9%	36%
3.00-BES	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets. Urinals are a 1.0 gpf and higher. Faucets use 2.0 gpf. There are forty-one (41) water closets, ten (10) urinals, and fifty-five (55) faucets in the facility.	New porcelain for all water closets designed for 1.6 gpf. Water closets w/ flush valves should have new 1.6 gpf flush valves installed to reduce retrofitting cost. Re-use existing urinal porcelain and replace flush valves with 0.5 gpf flush valves. Excluding Kitchen faucets, replace faucets with 0.5 gpm aerators where possible and replace remaining faucets with 0.5 gpm faucets.	Bellevue ES	\$67,300	\$81,400	\$550	\$680	\$0	\$0	\$67,300	\$81,400	-72%	-66%	-57%
3.01-BES	Irrigation Improvements	This site currently has a scheduled automated sprinkler system.	The irrigation system for this site could be optimized by verifying proper sprinkler heads are in the correct locations and verifying the proper sprinkler coverage, to minimize overwatering.	Bellevue ES	\$7,800	\$9,400	\$0	\$0	\$0	\$0	\$7,800	\$9,400	N/A	N/A	N/A
4.00-BES	DDC Retrofit	The Multi-purpose Room, Kitchen, Gym Lobby, Technology Room, Workroom, Front Office, and the East wing have programmable thermostats. The remaining areas have outdated pneumatic controls.	The existing control systems will be removed. Existing pneumatic piping will be capped. New DDC will be installed. DCV will be implemented where practical.	Bellevue ES	\$150,200	\$181,900	\$660	\$810	\$0	\$10,000	\$140,200	\$171,900	-85%	-82%	-77%
4.02-BES	Demand Control Ventilation	Existing ventilators located in South Wing and original building have two position outside air dampers. The East Wing has three Reznor gas furnaces that provide ventilation air to multiple classrooms. The Multi-purpose Room units provide outside air to the space.	Proposed solution dependent on FIM 5.01 (below), would be to install CO2 sensors and motorized outdoor air dampers that would vary the ventilation air based on need rather than a set amount.	Bellevue ES	\$4,600	\$5,500	\$20	\$20	\$0	\$0	\$4,600	\$5,500	-88%	-85%	-81%
4.03-BES	Economizer	This facility does not have air conditioning. The majority of heating and ventilation equipment does not have outside air dampers that would allow for the use of economizer cooling.	Add economizer controls under FIM 5.01	Bellevue ES	\$6,700	\$8,100	\$0	\$0	\$0	\$0	\$6,700	\$8,100	N/A	N/A	N/A
4.04-BES	Veridium	Based on the preliminary facility walk through there are one hundred and sixty-four computers (164) desktop computers in the facility each with a single dedicated monitor. There are nine (9) projectors, two (2) copy machines, and thirty-seven (37) printers in the facility that are all connected to the IT network.	Install Veridium software on School District server. This will allow the IT department to manage the power consumption of devices connected to the network.	Bellevue ES	\$3,700	\$4,400	\$700	\$860	\$0	\$1,600	\$2,100	\$2,800	546%	701%	900%
4.05-BES	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	Determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Bellevue ES	\$7,700	\$9,300	\$440	\$550	\$0	\$300	\$7,400	\$9,000	96%	142%	203%
4.06-BES	Freezer Temp Control	The walk-in freezer was set to maintain the temperature at -20 oF. The manufacturer's nameplate data listed the operating range as 0 oF to -17 oF.	The proposed solution is to adjust the set point to a lower level that is in the manufacturer's range and acceptable to the local jurisdiction.	Bellevue ES	\$200	\$200	\$0	\$0	\$0	\$0	\$200	\$200	N/A	N/A	N/A
5.01-BES	HVAC Retrofit	The facility currently has a combination of electric and natural gas heating and ventilation units. The facility has had four additions with the last two using natural gas as the heating fuel. The majority of the existing equipment has exceeded the useful life expectancy.	The proposed solution is to install a new system that will provide heating, ventilation, and cooling to the facility. A new system will provide easier maintenance, increased occupant comfort, and improved ventilation delivery to the spaces.	Bellevue ES	\$904,800	\$1,095,300	\$4,770	\$5,890	\$0	\$0	\$904,800	\$1,095,300	-82%	-78%	-72%

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Min	Max	Min	Max	Annual Operational Savings	Potential Utility Rebate **	Min	Max	5% escalation	7% escalation	9% escalation
5.06-BES	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution will be dependent upon the systems determined through FIM 5.01 above. The addition of air conditioning will ultimately increase the energy consumption of this facility however will increase the occupant comfort. In the event that FIM 5.01 above is not selected there is the potential to install split system direct expansion cooling for each space as a stand alone measure.	Bellevue ES	\$304,300	\$368,400	-\$10,300	-\$12,720	\$0	\$0	\$304,300	\$368,400	N/A	N/A	N/A
5.07-BES	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Bellevue ES	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.09-BES	Solar Snow Melt	The current snow melt system uses natural gas to heat the water that heats the ground to melt the snow.	The proposed solution would be to add a system that would add hot water solar panels to provide about half of the heated water necessary to melt the snow.	Bellevue ES	\$35,600	\$43,100	\$460	\$570	\$0	\$0	\$35,600	\$43,100	-56%	-46%	-32%
7.03-BES	Door Retrofit	Each classroom has an exterior door. The door hardware does not meet ADA requirements and the doors do not seal well resulting in a significant loss of the conditioned air in the classrooms to the outdoors.	The proposed solution is to replace the doors and frames with new equipment that will meet ADA requirements and effectively seal the area around the door to minimize the loss of the conditioned air from the space. Depending on the requirements of the local jurisdiction and the preference of the School District another option would be to remove these doors and seal the opening to match the existing insulation values of the structure.	Bellevue ES	\$56,800	\$68,700	\$510	\$630	\$0	\$0	\$56,800	\$68,700	-70%	-62%	-53%
7.05-BES	Catwalk to access H&V	The Multi-purpose Room heating and ventilation units are not easily accessible resulting in safety concerns for the maintenance and decreased efficiency/frequency of maintenance.	The proposed solution is to install a catwalk/ladder and platform system that will allow for the appropriate maintenance to be performed while improving the safety of the maintenance staff.	Bellevue ES	\$58,800	\$71,200	\$0	\$0	\$0	\$0	\$58,800	\$71,200	N/A	N/A	N/A
9.00-BES	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Bellevue ES	\$500	\$600	\$40	\$50	\$0	\$0	\$500	\$600	176%	242%	326%
9.01-BES	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining forty (40) CRT monitors with LCD monitors.	Bellevue ES	\$9,700	\$11,800	\$190	\$230	\$0	\$400	\$9,300	\$11,400	-36%	-20%	0%
10.00-BES	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Bellevue ES	\$122,100	\$147,900	\$0	\$0	\$0	\$0	\$122,100	\$147,900	N/A	N/A	N/A
10.01-BES	Fire Sprinkler Addition	This building currently does not have a fire sprinkler system	The proposed work is to install fire sprinkler system throughout the building.	Bellevue ES	\$179,300	\$217,100	\$0	\$0	\$0	\$0	\$179,300	\$217,100	N/A	N/A	N/A
10.03-BES	Install Drop Ceiling	This building has several different types of ceilings. It would be beneficial from a maintenance and access stand point to install a drop ceiling throughout the building.	The proposed work is to install a t-bar drop ceiling where desired, and to replace any damaged part of an existing drop ceiling.	Bellevue ES	\$296,000	\$358,300	\$0	\$0	\$0	\$0	\$296,000	\$358,300	N/A	N/A	N/A
10.04-BES	Multipurpose Room Addition	This school currently needs more multipurpose area to serve the students.	The proposed work is to add a 15,000 square foot multipurpose type building on this school campus.	Bellevue ES	\$1,133,300	\$1,371,900	\$0	\$0	\$0	\$0	\$1,133,300	\$1,371,900	N/A	N/A	N/A
11.00-BES	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Bellevue ES	\$11,900	\$14,400	\$0	\$0	\$0	\$0	\$11,900	\$14,400	N/A	N/A	N/A
3.01-CAC	Irrigation Improvements	This site currently does not have Maxicon irrigation control system.	The proposed solution would be to add the Maxicon control system to provide weather based irrigation control.	Carey Campus	\$59,700	\$72,300	\$0	\$0	\$0	\$0	\$59,700	\$72,300	N/A	N/A	N/A

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5.03-CAC	Biomass Central Plant	The use of wood waste (biomass) as the heating fuel for the Carey campus would provide a lower fuel cost and renewable option for heating of the facilities.	The proposed solution would be to install a central woody, biomass-fired boiler plant and to pipe hot water to the facility for use in heating the spaces. Various options will be analyzed to determine the best Total Cost of Ownership approach to provide hydronic heating. -- There is the possibility at each school to use ground water to heat and cool the buildings with a water source heat pump loop. The proposed solution would be determined by the temperature and quantity of the water found near the building site. If it is a low temperature a heat pump loop system would work well. If it is a high temperature a hot water loop would be the best solution.	Carey Campus	\$2,436,800	\$2,949,800	\$34,340	\$42,420	\$0	\$0	\$2,436,800	\$2,949,800	-52%	-41%	-26%
6.00-CAC	Waste Management	The waste management services uses a standard rate based on the number of collections and the size of the container regardless of the amount of waste actually collected.	The proposed solution is to add a trash compactor.	Carey Campus	\$57,100	\$69,100	\$1,910	\$2,360	\$0	\$0	\$57,100	\$69,100	13%	40%	75%
7.04-CAC	Covered Walkway	The Carey campus consists of Carey Elementary School, Carey High School, and the Carey Gym. The students and staff regularly are required to travel between these three facilities but there are not covered walkways between the facilities.	The proposed solution is to install a covered walkway between the Carey Elementary School Cafeteria and the Carey Gym building. Depending on the inclusion of FIM 5.03 above, the installation of the covered walkway could also include a utility corridor beneath the walking surface to allow for piping, electrical, and data interconnection of the facilities.	Carey Campus	\$78,800	\$95,300	\$0	\$0	\$0	\$0	\$78,800	\$95,300	N/A	N/A	N/A
1.01-CES	Lighting (All)	In the high ceiling areas there are pendant mounted metal halide fixtures. In the other areas there is a mixture of T12 lighting and T8 lighting.	The proposed solution would be to replace the metal halide fixtures with fixtures that use T-5 lamps, and replace all the T12 with T8 fixtures and electronic ballasts.	Carey ES	\$63,400	\$76,700	\$2,400	\$2,970	\$746	\$7,700	\$55,700	\$69,000	28%	59%	98%
1.02-CES	Lighting Controls	The lighting controls are currently all manual light switches.	Each classroom should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Carey ES	\$19,400	\$23,500	\$450	\$550	\$0	\$3,000	\$16,400	\$20,500	-23%	-4%	20%
3.00-CES	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets throughout. The urinals are 1.0 gpf and higher fixtures. The faucets and shower heads use 2.5 gpm. There are twenty-four (24) water closets, ten (10) urinals, eleven (11) shower heads, and forty-one (41) faucets in the facility. There is one (1) drinking fountains with a cooler and four (4) drinking fountains in the remaining areas of the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding kitchen faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm.	Carey ES	\$53,900	\$65,300	\$250	\$310	\$0	\$0	\$53,900	\$65,300	-84%	-81%	-76%
4.00-CES	DDC Retrofit	Existing DDC are connected to the Web Control front end. These controls provide good scheduled control but are not adaptable to occupancy sensors and are limited in their ability to control newer HVAC equipment.	To Be Determined based on work performed under FIM #5.01, FIM #5.03, and FIM #5.06 below. A full DDC retrofit design for any new HVAC equipment, utilizing DCV where practical.	Carey ES	\$155,100	\$187,700	\$1,250	\$1,550	\$0	\$10,000	\$145,100	\$177,700	-73%	-66%	-58%
4.02-CES	Demand Control Ventilation	The existing Gym units are 100% outside air units. When the units are operating they pull all of their air from outdoors and condition the air to maintain a temperature set point. The amount of outdoor air required to properly ventilate the space is not currently dependent upon the occupancy of the space resulting in the heating of outdoor air when high ventilation rates are not required. The remaining areas in the building should also be considered for Demand Control Ventilation if the new HVAC systems (see FIM 5.01 below) allow for economical installations.	The proposed solution is dependent upon the implementation of FIM 4.00 (above). Return air ductwork will be installed between new return air grilles installed in the Gym and the mechanical room plenum. The outside air duct at the unit will be modified with control dampers to provide mixing of the required ventilation air and the conditioned return air from the space. To implement Demand Control Ventilation on the Gym units: a CO2 sensor will be installed outdoors to measure the ambient CO2 concentration levels and CO2 sensors will be installed in each of the Gym units return ductwork at a location selected to allow easy maintenance and calibration of the CO2 sensors. The sensors will be tied into the DDC system installed as part of FIM 4.00 above and will control the outside air dampers to maintain an acceptable ppm differential between the space and outdoors.	Carey ES	\$5,700	\$6,900	\$40	\$50	\$0	\$0	\$5,700	\$6,900	-76%	-70%	-63%
4.03-CES	Economizer	The facility currently does not have air conditioning, so the installation of economizer controls could potentially impact the occupant comfort but would result in minimal savings.	The proposed solution is to add economizer controls to the new HVAC installation under FIM 5.01 below.	Carey ES	\$6,700	\$8,100	\$0	\$0	\$0	\$0	\$6,700	\$8,100	N/A	N/A	N/A

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.04-CES	Verdium	Based on the preliminary facility walk through there are ninety-five (95) desktop computers in the facility each with a single dedicated monitor and one (1) laptop computer. There are forty-three (43) CRT style computer monitors and fifty-three (53) LCD computer monitors. There are six (6) projectors, one (1) copy machines and eighteen (18) printers in the facility that are all connected to the IT network. All of these quantities should be confirmed with the School District's IT department.	The proposed solution is to install the Verdium software on the School District's server. The software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Carey ES	\$2,500	\$3,100	\$470	\$580	\$0	\$1,100	\$1,400	\$2,000	519%	667%	857%
4.05-CES	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position. Based on the preliminary site walk through the following list represents an account of these devices: six (6) televisions, eight (8) microwaves, five (5) small refrigerators, four (4) desk lamp, two (2) large refrigerators, one (1) ice machine, sixteen (16) radios, two (2) fans, three (3) paper shredders, nine (9) DVD/VCR units, six (6) audio recorders, one (1) washing machine, one (1) clothes dryer, one (1) digital photo frame, and one (1) treadmill.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Carey ES	\$4,400	\$5,300	\$250	\$310	\$0	\$200	\$4,200	\$5,100	93%	140%	199%
4.07-CES	Vending Miser Install	The facility has one (1) cold drink vending machine.	The proposed solution is to install a device that will disconnect power to the lighting and compressors associated with the vending machine during periods when the area in front of the vending machine is not occupied. An occupancy sensor will be installed that will determine if the area in front of the machine is occupied.	Carey ES	\$700	\$800	\$90	\$120	\$0	\$0	\$700	\$800	396%	515%	667%
5.01-CES	HVAC Retrofit	The facility currently has electric heating and ventilation units. The facility has had two additions. The majority of the existing equipment has exceeded the expected useful life.	The proposed solution is to install a new system that will provide heating, ventilation, and cooling to the facility. A new system will provide easier maintenance, increased occupant comfort, and improved ventilation delivery to the spaces.	Carey ES	\$709,100	\$858,400	\$7,110	\$8,780	\$0	\$0	\$709,100	\$858,400	-66%	-58%	-48%
5.06-CES	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution will be dependent upon the systems determined through FIM 5.01 above. The addition of air conditioning will ultimately increase the energy consumption of this facility however will increase the occupant comfort. In the event that FIM 5.01 above is not selected there is the potential to install split system direct expansion cooling for each space as a stand alone measure.	Carey ES	\$156,100	\$188,900	-\$11,850	-\$14,640	\$0	\$0	\$156,100	\$188,900	N/A	N/A	N/A
5.07-CES	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Carey ES	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.10-CES	Repair Ductwork Insulation	The supply ductwork above the 1st grade - 6th grade wing was originally insulated to reduce the energy lost in delivery of the heating and ventilation air to the spaces. It was noted that this insulation is falling off and therefore is not effective.	The proposed solution is to repair the damaged insulation to return the system to the original intended operation.	Carey ES	\$3,000	\$3,600	\$0	\$0	\$0	\$0	\$3,000	\$3,600	N/A	N/A	N/A
7.01-CES	Window Retrofit	The Kindergarten Wing has single pane windows that are less efficient than the current industry standard window type.	The windows in the Kindergarten Wing would be replaced with new double pane windows. The new windows will reduce the heat loss through the windows and decrease the amount of exterior noise transmitted into the learning environment.	Carey ES	\$13,400	\$16,200	\$430	\$530	\$0	\$0	\$13,400	\$16,200	8%	34%	67%
7.03-CES	Door Retrofit	Each classroom has an exterior door. The door hardware does not meet ADA requirements and the doors do not seal well resulting in a significant loss of the conditioned air in the classrooms to the outdoors.	The proposed solution is to replace the doors and frames with new equipment that will meet ADA requirements and effectively seal the area around the door to minimize the loss of the conditioned air from the space. Depending on the requirements of the local jurisdiction and the preference of the School District another option would be to remove these doors and seal the opening to match the existing insulation values of the structure.	Carey ES	\$56,800	\$68,700	\$570	\$700	\$0	\$0	\$56,800	\$68,700	-66%	-58%	-48%

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9.00-CES	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Carey ES	\$500	\$600	\$20	\$30	\$0	\$0	\$500	\$600	65%	105%	156%
9.01-CES	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Carey ES	\$9,700	\$11,800	\$190	\$230	\$0	\$400	\$9,300	\$11,400	-36%	-20%	0%
10.00-CES	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Carey ES	\$94,900	\$114,900	\$0	\$0	\$0	\$0	\$94,900	\$114,900	N/A	N/A	N/A
10.01-CES	Fire Sprinkler Addition	This building currently does not have a fire sprinkler system	The proposed work is to install fire sprinkler system throughout the building.	Carey ES	\$160,200	\$193,900	\$0	\$0	\$0	\$0	\$160,200	\$193,900	N/A	N/A	N/A
10.03-CES	Install Drop Ceiling	This building has several different types of ceilings. It would be beneficial from a maintenance and access stand point to install a drop ceiling throughout the building.	The proposed work is to install a t-bar drop ceiling where desired, and to replace any damaged part of an existing drop ceiling.	Carey ES	\$232,000	\$280,900	\$0	\$0	\$0	\$0	\$232,000	\$280,900	N/A	N/A	N/A
11.00-CES	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Carey ES	\$11,800	\$14,300	\$0	\$0	\$0	\$0	\$11,800	\$14,300	N/A	N/A	N/A
3.00-CGY	Water Fixture Retrofit	The facility utilizes 3.5 gpf or greater water closets throughout. The urinals are 1.0 gpf fixtures. The faucets use 2.0 gpm and the showerheads use 2.5 gpm. There are thirteen (13) water closets, four (4) urinals, eighteen (18) showerheads, and thirteen (13) faucets in the facility. There is one (1) drinking fountain with a cooler and two (2) drinking fountains in the remaining areas of the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding Concession faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm. Low flow showerheads should be installed to replace the existing showerheads. It was noted during the walk through that two showerheads in the Boy's Locker Room were not shutting off which may require complete valve replacements for those units.	Carey Gym	\$24,400	\$29,500	\$170	\$210	\$0	\$0	\$24,400	\$29,500	-76%	-71%	-64%
4-CGY	DDC Retrofit	This building currently has DDC that are very functional. Existing DDC provides good scheduled control.	To Be Determined based on work performed under FIM #5.03 and FIM #5.06 below. During the walk through it was noted that the exhaust fans are controlled by a wall switch that requires a custodian to switch them off. Adding the exhaust fans to the DDC system would be beneficial. DCV will provide energy savings while improving IAQ.	Carey Gym	\$32,300	\$39,100	\$990	\$1,220	\$0	\$4,700	\$27,600	\$34,400	3%	28%	60%
4.02-CGY	Demand Control Ventilation	The Gym units (quantity 3) provide ventilation air to the space. The Gym units have return air openings to allow for mixed air control. The typical installation is to set the outside air minimum position based on the maximum occupancy of the space. The result is over ventilation of the space when operating below peak occupancy and increased energy consumption to condition the large amount of ventilation air.	To implement Demand Control Ventilation in the Gym a CO2 sensor will be installed outdoors to measure the ambient CO2 concentration levels and CO2 sensors will be installed in the Gym (protective cage is strongly recommended) at a location selected to allow easy maintenance and calibration of the CO2 sensors. The sensors will be tied into the DDC system and will control the outside air dampers to maintain an acceptable ppm differential between the space and outdoors. This measure should include costs to repair/replace the existing outside air dampers.	Carey Gym	\$14,600	\$17,600	\$440	\$550	\$0	\$0	\$14,600	\$17,600	3%	28%	60%
4.03-CGY	Economizer	The facility currently does not have air conditioning therefore minimizing the energy efficiency increase potential, however the use of economizer controls in conjunction with FIM 4.02 (above) and FIM 5.06 (below) should result in increased occupant comfort.	The proposed solution is to add economizer controls to the new air conditioning installation under FIM 5.06 below.	Carey Gym	\$5,400	\$6,500	\$0	\$0	\$0	\$0	\$5,400	\$6,500	N/A	N/A	N/A

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

This information is proprietary and confidential

FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.07-CGY	Vending Miser Install	The facility has three (3) cold drink vending machines.	The proposed solution is to install a device that will disconnect power to the lighting and compressors associated with the vending machine during periods when the area in front of the vending machine is not occupied. An occupancy sensor will be installed that will determine if the area in front of the machine is occupied.	Carey Gym	\$1,700	\$2,000	\$290	\$360	\$0	\$200	\$1,500	\$1,800	495%	638%	821%
4.08-CGY	DHW set point Adjust	The domestic water heaters in this facility are set at very high temperatures. The result is increased energy consumption due to maintaining the water in the storage tanks at this high level.	The proposed solution is to reduce the set point to a lower level that will meet the needs of the occupants.	Carey Gym	\$200	\$200	\$270	\$340	\$0	\$0	\$200	\$200	5521%	6869%	8597%
5.06-CGY	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year and during large events such as graduation where the space is highly occupied.	The addition of air conditioning will ultimately increase the energy consumption of this facility however, will increase the occupant comfort.	Carey Gym	\$55,900	\$67,700	-\$6,770	-\$8,360	\$0	\$0	\$55,900	\$67,700	-508%	-606%	-732%
7.05-CGY	Catwalk to access H&V	The existing heating and ventilation units in the Gym are difficult to maintain due to the location and height that they are installed. The result is a reduction in the amount and frequency of maintenance on the units that results in increased energy usage and decreased equipment performance.	The proposed solution is to install a permanent ladder and catwalk along the wall near to the units that will allow for increased maintenance on the units.	Carey Gym	\$58,800	\$71,200	\$0	\$0	\$0	\$0	\$58,800	\$71,200	N/A	N/A	N/A
10.00-CGY	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Carey Gym	\$16,600	\$20,100	\$0	\$0	\$0	\$0	\$16,600	\$20,100	N/A	N/A	N/A
11.00-CGY	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Carey Gym	\$11,800	\$14,300	\$0	\$0	\$0	\$0	\$11,800	\$14,300	N/A	N/A	N/A
1.01-CHS	Lighting (All)	In the high ceiling areas there are pendant mounted metal halide fixtures. In the other areas there is a mixture of T12 lighting and T8 lighting.	The proposed solution would be to replace the metal halide fixtures with fixtures that use T-5 lamps, and replace all the T12 with T8 fixtures and electronic ballasts.	Carey HS	\$35,400	\$42,800	\$1,330	\$1,640	\$228	\$4,500	\$30,900	\$38,300	27%	57%	96%
1.02-CHS	Lighting Controls	The lighting controls are currently all manual light switches.	Each classroom should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Carey HS	\$13,800	\$16,700	\$690	\$850	\$0	\$2,400	\$11,400	\$14,300	68%	109%	160%
4.00-CHS	DDC Retrofit	The building currently has an Allerton control system which controls the mechanical system schedules and space set points.	The proposed work is to remove the current Allerton system and install an Automated Logic system, so that this school would have the same system as the other schools. One less expensive option up front would be to add a third party interface so that the Automated Logic system could control the Allerton system. Then as the Allerton controllers begin to fail they could be changed with Automated Logic controllers.	Carey HS	\$59,800	\$72,400	\$1,540	\$1,900	\$0	\$2,500	\$57,300	\$69,900	-13%	8%	34%
4.02-CHS	Demand Control Ventilation	The existing classrooms that are served by a dedicated furnace can benefit from Demand Control Ventilation. Typical design standards are to set the minimum outside air damper position at a point to provide the required ventilation during peak occupancy. The ventilation load can be significantly reduced by controlling the amount of ventilation air to match the actual occupancy of the space.	To implement Demand Control Ventilation CO2 sensors will be installed outdoors to measure the ambient CO2 concentration levels and CO2 sensors will be installed in each classroom at a location selected to allow easy maintenance and calibration of the CO2 sensors. The sensors will be tied into the DDC system and will control the outside air dampers to maintain an acceptable ppm differential between the space and outdoors. This measure should include costs to repair/replace the existing outside air dampers.	Carey HS	\$5,700	\$6,900	\$140	\$170	\$0	\$0	\$5,700	\$6,900	-19%	1%	26%
4.04-CHS	Verdium	Based on the preliminary facility walk through there are one hundred and six (106) desktop computers and two (2) laptop computers in the facility each with a single dedicated monitor. The computer monitors are a combination of forty-eight (48) LCD monitors and sixty (60) CRT monitors. There are nine (9) projectors, one (1) copy machine, four (4) scanners, one (1) server, and sixteen (16) printers in the facility that are all connected to the IT network. All of these quantities should be confirmed with the School District's IT department.	The proposed solution is to install the Verdium software on the School District's server. The software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Carey HS	\$2,700	\$3,300	\$520	\$650	\$0	\$1,200	\$1,500	\$2,100	551%	707%	908%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.05-CHS	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position. Based on the preliminary site walk through the following list represents an account of these devices: nineteen (19) televisions, five (5) microwaves, three (3) small refrigerators, one (1) coffee machine, two (2) large refrigerators, one (1) blender, four (4) radios, one (1) fan, two (2) paper shredders, sixteen (16) DVD/VCR units, one (1) personal floor heating unit, one (1) table saw, one (1) miter saw, one (1) planer, one (1) jointer, three (3) jig saws, three (3) drill presses, and five (5) musical instruments.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Carey HS	\$4,400	\$5,300	\$250	\$310	\$0	\$200	\$4,200	\$5,100	93%	140%	199%
4.07-CHS	Vending Miser Install	The facility has one (1) cold drink vending machine.	The proposed solution is to install a device that will disconnect power to the lighting and compressors associated with the vending machine during periods when the area in front of the vending machine is not occupied. An occupancy sensor will be installed that will determine if the area in front of the machine is occupied.	Carey HS	\$700	\$800	\$90	\$120	\$0	\$0	\$700	\$800	396%	515%	667%
4.08-CHS	DHW set point Adjust	The domestic water heaters in this facility are set at very high temperatures. The result is increased energy consumption due to maintaining the water in the storage tanks at this high level.	The proposed solution is to reduce the set point to a lower level that will meet the needs of the occupants.	Carey HS	\$200	\$200	\$260	\$330	\$0	\$0	\$200	\$200	5356%	6664%	8341%
5.06-CHS	Cooling Addition	The facility currently does not have air conditioning in the Construction Shop and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution is to install split system direct expansion cooling.	Carey HS	\$14,700	\$17,800	-\$180	-\$220	\$0	\$0	\$14,700	\$17,800	N/A	N/A	N/A
5.07-CHS	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Carey HS	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.08-CHS	DHW Recirc loop	The domestic hot water system does not provide hot water to the faucets in an acceptable timeframe to the occupants.	The proposed solution is to install a recirculation pump and piping to allow for hot water to effectively be delivered to the occupants.	Carey HS	\$8,500	\$10,300	\$0	\$0	\$0	\$0	\$8,500	\$10,300	N/A	N/A	N/A
7.03-CHS	Door Retrofit	The doors do not seal well resulting in a significant loss of the conditioned air in the classrooms to the outdoors.	The proposed solution is to replace the doors and frames with new equipment that will meet ADA requirements and effectively seal the area around the door to minimize the loss of the conditioned air from the space. A lower cost solution may be to install new weather stripping and door jams that will allow for a tighter door seal.	Carey HS	\$17,100	\$20,600	\$230	\$290	\$0	\$0	\$17,100	\$20,600	-53%	-42%	-28%
8.00-CHS	RCx	Carey High School has approximately 60 pieces of mechanical equipment; half of which are residential style furnaces with split DX cooling.	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Carey HS	\$37,500	\$45,400	\$1,680	\$2,070	\$0	\$0	\$37,500	\$45,400	51%	87%	133%
9.00-CHS	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Carey HS	\$500	\$600	\$20	\$30	\$0	\$0	\$500	\$600	65%	105%	156%
9.01-CHS	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Carey HS	\$9,700	\$11,800	\$190	\$230	\$0	\$400	\$9,300	\$11,400	-36%	-20%	0%
11.00-CHS	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Carey HS	\$11,600	\$14,100	\$0	\$0	\$0	\$0	\$11,600	\$14,100	N/A	N/A	N/A

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
1.01-CC	Lighting (All)	Most of the Community Campus consists of T12 lighting with magnetic ballasts.	These lights can be replaced with T8 lighting with electronic ballasts. The gym has T12 lighting fixtures which can be changed to high-output lighting fixtures improving the lighting in these areas.	Comm. Campus	\$289,300	\$350,200	\$4,720	\$5,830	\$1,323	\$17,400	\$271,900	\$332,800	-45%	-32%	-15%
1.02-CC	Lighting Controls	The lighting controls are currently all manual light switches.	Each area should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Comm. Campus	\$25,100	\$30,400	\$1,010	\$1,240	\$0	\$5,200	\$19,900	\$25,200	35%	67%	109%
3.00-CC	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets throughout. The urinals are a combination of 1.0 gpf and higher fixtures. The faucets use 2.0 gpm. There are twenty-five (25) water closets, eleven (11) urinals, and sixty (60) faucets in the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding Kitchen faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm.	Comm. Campus	\$45,000	\$54,500	\$470	\$590	\$0	\$0	\$45,000	\$54,500	-64%	-56%	-45%
4.01-CC	DDC Optimization	The current DDC system has fixed MAU and HP loop control. The building is scheduled about 7am to 10pm, and has night time setback. Due to the variable use of this building, a typical schedule may not be the best fit.	The proposed work would incorporate occupancy sensor control of heat pumps into the existing controllers. This would allow the building to be more flexible, and reduce energy consumption when the building is unoccupied. The heat pump loop temperature could be allowed to reset based on building need as well.	Comm. Campus	\$45,300	\$54,800	\$1,810	\$2,240	\$0	\$2,500	\$42,800	\$52,300	35%	68%	109%
4.02-CC	Demand Control Ventilation	The ventilation is supplied by both MAUs and HVLU's. These units currently bring in a fixed minimum outside air regardless of building occupancy level.	The proposed work would be to install IAQ sensors and regulate the minimum ventilation levels based on IAQ need	Comm. Campus	\$5,700	\$6,900	\$220	\$280	\$0	\$0	\$5,700	\$6,900	34%	66%	108%
4.03-CC	Economizer	This facility has heating and ventilating units for major common spaces. These have ventilation air but the economizers are not used to their potential.	The proposed solution is to add economizer controls to the new air conditioning installation under FIM 5.06 below.	Comm. Campus	\$8,000	\$9,700	\$320	\$390	\$0	\$0	\$8,000	\$9,700	33%	65%	106%
4.04-CC	Verdium	Based on the preliminary facility walk through there are twenty-nine (29) desktop computers in the facility each with a single dedicated monitor. There are three (3) projectors, and five (5) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Comm. Campus	\$700	\$800	\$120	\$150	\$0	\$200	\$500	\$600	520%	669%	859%
4.05-CC	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Comm. Campus	\$5,500	\$6,600	\$310	\$390	\$0	\$200	\$5,300	\$6,400	95%	142%	202%
5.01-CC	HVAC Retrofit	The facility currently has an all electric heating, ventilation and air conditioning system. It consists of a water source heat pump loop that is heated by an electric boiler and cooled with a cooling tower. The heat pumps obtain ventilation air from one of five units that bring in outside air and duct the air into the plenum above the ceiling. There are large air handling units that serve the gym, auditorium, kitchen hood, gymnastics area, and the locker rooms. These large air handlers all use electric heat to provide heat to the respective locations. None of these large air handlers have cooling capability.	The proposed solution is to replace all the heat pumps in this building with similar heat pumps, changing size and ducting if necessary due to zone changes over the years. At the time that the heat pumps are replaced, the existing drop ceiling grid will be removed, and replaced with a new typical 2'x4' drop ceiling grid. The stage area in the auditorium should receive a dedicated HVAC system for that space alone, so that the large auditorium air handler would not have to run if only the stage was being used. See the FIM descriptions for more information on three options for changes to the larger air handlers.	Comm. Campus	\$948,900	\$1,148,600	\$0	\$0	\$0	\$0	\$948,900	\$1,148,600	N/A	N/A	N/A

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

This information is proprietary and confidential					Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
5.02-CC	Install VFD on HP loop pumps	The current pumps are scheduled to turn off at night, but if any area is calling for heating or cooling the pumps turn on, which causes them to run much longer at full capacity than desired.	Install a variable frequency drive on the heat pump loop pumps, to vary the flow depending on building requirements.	Comm. Campus	\$38,800	\$47,000	\$1,500	\$1,860	\$0	\$600	\$38,200	\$46,400	31%	62%	102%
5.07-CC	Solar Array (20kW)	This building currently has a 1.1kW solar array to be used as an educational tool.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Comm. Campus	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
7.00-CC	Auditorium Arch Improvements	The current 650 seat auditorium is used by the high school students for a variety of activities, which has not been upgraded or remodeled since the original building was constructed.	The proposed work would include updated house lighting associated with FIM 1.01, updated stage lighting including control panel, updated carpet, updating in seating, updated sounds system with control panel, any necessary acoustical upgrades, and the addition of a projector with a drop screen.	Comm. Campus	\$729,000	\$882,500	\$0	\$0	\$0	\$0	\$729,000	\$882,500	N/A	N/A	N/A
7.03-CC	Door Retrofit	Several of the entry door frames have become rusted over the years and should be replaced.	Replace door frames which show any signs of rust.	Comm. Campus	\$28,400	\$34,400	\$280	\$350	\$0	\$0	\$28,400	\$34,400	-66%	-58%	-48%
8.00-CC	RCx	Community Campus has over 70 pieces of mechanical equipment: most of which are heat pumps	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Comm. Campus	\$46,500	\$56,300	\$2,360	\$2,920	\$0	\$0	\$46,500	\$56,300	71%	113%	165%
9.00-CC	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Comm. Campus	\$500	\$600	\$30	\$40	\$0	\$0	\$500	\$600	120%	173%	241%
9.01-CC	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Comm. Campus	\$3,400	\$4,200	\$60	\$80	\$0	\$100	\$3,300	\$4,100	-37%	-22%	-3%
10.01-CC	Fire Sprinkler Addition	This building currently does not have a full fire sprinkler system throughout the facility	The proposed work is to install fire sprinkler system throughout the building where the building does not already have it.	Comm. Campus	\$350,800	\$424,700	\$0	\$0	\$0	\$0	\$350,800	\$424,700	N/A	N/A	N/A
10.03-CC	Install Drop Ceiling	This building has several different types of ceilings. It would be beneficial from a maintenance and access stand point to install a drop ceiling throughout the building.	The proposed work is to install a t-bar drop ceiling where desired, and to replace any damaged part of an existing drop ceiling.	Comm. Campus	\$508,800	\$615,900	\$0	\$0	\$0	\$0	\$508,800	\$615,900	N/A	N/A	N/A
11.00-CC	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Comm. Campus	\$13,200	\$16,000	\$0	\$0	\$0	\$0	\$13,200	\$16,000	N/A	N/A	N/A
4.00-DOB	DDC Retrofit	The building has seven zones with programmable stats and fixed position outside air dampers.	The seven zones would be added to the DDC network and damper motors would close outside air intake when ventilation is not necessary.	District Office Building	\$25,900	\$31,300	\$300	\$380	\$0	\$2,000	\$23,900	\$29,300	-60%	-50%	-38%
4.04-DOB	Verdium	Based on the preliminary facility walk through there are thirty-six (36) desktop computers in the facility each with a single dedicated monitor. There are two (2) projectors, two (2) copy machines, and twelve (12) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	District Office Building	\$800	\$1,000	\$150	\$190	\$0	\$300	\$500	\$700	528%	679%	872%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.05-DOB	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole 1DP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	District Office Building	\$3,700	\$4,500	\$210	\$260	\$0	\$100	\$3,600	\$4,400	91%	137%	196%
9.00-DOB	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	District Office Building	\$500	\$600	\$20	\$20	\$0	\$0	\$500	\$600	10%	37%	71%
9.01-DOB	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	District Office Building	\$1,500	\$1,800	\$20	\$30	\$0	\$0	\$1,500	\$1,800	-45%	-32%	-15%
10.01-DOB	Fire Sprinkler Addition	This building currently does not have a fire sprinkler system	The proposed work is to install fire sprinkler system throughout the building.	District Office Building	\$36,200	\$43,800	\$0	\$0	\$0	\$0	\$36,200	\$43,800	N/A	N/A	N/A
11.00-DOB	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	District Office Building	\$11,800	\$14,300	\$0	\$0	\$0	\$0	\$11,800	\$14,300	N/A	N/A	N/A
1.01-HAE	Lighting (All)	The majority of the facility utilizes T12 lamps with magnetic ballasts.	The proposed installation is to replace the existing fixtures with T8 lighting with electronic ballasts. The gym and cafeteria have various lighting fixtures which can be changed to high-output lighting fixtures improving the lighting in these areas.	Hailey ES	\$124,400	\$150,600	\$4,310	\$5,330	\$1,137	\$12,800	\$111,600	\$137,800	17%	45%	81%
1.02-HAE	Lighting Controls	The lighting controls are currently all manual light switches.	Each classroom should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Hailey ES	\$31,000	\$37,500	\$930	\$1,150	\$0	\$6,000	\$25,000	\$31,500	1%	26%	57%
2.01-HAE	Transformer Move-Consolidation	The school is currently served by two, single phase, step down pad mount transformers provided by Idaho Power. The two existing units are aging and their location hinders the ability to maintain or repair them.	This measure includes the cost to run conduit, wiring, and concrete pad for a new transformer provided by the electric utility near the existing power pole.	Hailey ES	\$90,800	\$109,900	\$0	\$0	\$0	\$0	\$90,800	\$109,900	N/A	N/A	N/A
3.00-HAE	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets throughout. The urinals are a combination of 1.0 gpf and higher fixtures. The faucets use 2.0 gpm. There are thirty four (34) water closets, thirteen (13) urinals, and thirty-nine (39) faucets in the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding kitchen faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm.	Hailey ES	\$57,300	\$69,400	\$2,620	\$3,240	\$0	\$0	\$57,300	\$69,400	54%	91%	139%
3.01-HAE	Irrigation Improvements	Part of this site currently does not have Maxicon irrigation control system. The athletic field does have it.	The proposed solution would be to extend the Maxicon system to cover the athletic field and do a water audit. The water placement would be adjusted to get the best use out of the weather based Maxicon system.	Hailey ES	\$59,100	\$71,600	\$7,680	\$9,490	\$0	\$0	\$59,100	\$71,600	338%	443%	578%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.00-HAE	DDC Retrofit	The eight classrooms in the fifth grade wing all have programmable thermostats. It was noted that the programming in most of these thermostats was not consistent allowing the equipment to operate later in the day than necessary. The remaining areas of the facility have an out dated pneumatic control system with a mechanical time-clock.	The proposed solution is to expand the Automated Logic DDC control system to include this facility. The existing programmable thermostats and pneumatic control system will be removed. The existing pneumatic piping will be capped at the wall penetrations. Where possible, the new DDC thermostats will be installed at the same location as the existing thermostats. Provide a wall plate painted to match the existing wall behind the new DDC thermostat as a patch. The new DDC system will allow for remote monitoring and troubleshooting of the HVAC system, holiday scheduling, time of day scheduling, and optimal start/stop of equipment. See FIM 5.01 below for details regarding the HVAC systems.	Hailey ES	\$168,000	\$203,400	\$4,940	\$6,100	\$0	\$10,000	\$158,000	\$193,400	-1%	23%	53%
4.04-HAE	Verdium	Based on the preliminary facility walk through there are two hundred and thirty-four (234) desktop computers in the facility each with a single dedicated monitor. There are twenty-six (26) projectors, two (2) copy machines, and fifty-five (55) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Hailey ES	\$5,200	\$6,300	\$1,000	\$1,230	\$0	\$2,300	\$2,900	\$4,000	546%	700%	899%
4.05-HAE	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Hailey ES	\$9,200	\$11,100	\$530	\$660	\$0	\$400	\$8,800	\$10,700	97%	144%	204%
4.07-HAE	Vending Miser Install	There is one soda machine and one vending machine in this building and neither have vending misers installed on them.	The proposed solution is to install a device that will disconnect power to the lighting and compressors associated with the vending machine during periods when the area in front of the vending machine is not occupied. An occupancy sensor will be installed that will determine if the area in front of the machine is occupied.	Hailey ES	\$1,200	\$1,400	\$90	\$120	\$0	\$100	\$1,100	\$1,300	183%	251%	339%
5.01-HAE	HVAC Retrofit	The facility currently has a combination of electric and natural gas heating and ventilation units. The facility has had four additions with the last two using natural gas as the heating fuel. The majority of the existing equipment has exceeded the expected useful life expectancy.	The proposed solution is to install a new system that will provide heating, ventilation, and air conditioning to the facility. A new system will provide easier maintenance, increased occupant comfort, and improved ventilation delivery to the spaces. There are a number of potential systems that can be installed each having a different initial installation cost and Total Cost of Ownership (TCO). See the FIM description sheet for three identified options.	Hailey ES	\$1,560,700	\$1,889,300	\$50,890	\$62,860	\$0	\$0	\$1,560,700	\$1,889,300	10%	36%	70%
5.06-HAE	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution will be dependent upon the systems determined through FIM 5.01 above. The addition of air conditioning will ultimately increase the energy consumption of this facility however will increase the occupant comfort. In the event that FIM 5.01 above is not selected there is the potential to install split system direct expansion cooling for each space as a stand alone measure.	Hailey ES	\$366,700	\$443,900	-\$38,290	-\$47,300	\$0	\$0	\$366,700	\$443,900	N/A	N/A	N/A
5.07-HAE	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Hailey ES	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.09-HAE	Solar Snow Melt	The current snow melt system uses natural gas to heat the water that heats the ground to melt the snow.	The proposed solution would be to add a system that would add hot water solar panels to provide about half of the heated water necessary to melt the snow.	Hailey ES	\$35,600	\$43,100	\$460	\$570	\$0	\$0	\$35,600	\$43,100	-56%	-46%	-32%
7.01-HAE	Window Retrofit	There are large portions of this building with single pane windows. The West facade of upper Hailey has approximately 350 square foot of single pane windows. Lower Hailey (with the exception of the 5th grade wing) has about 50 square feet of single pane windows.	The proposed solution would be to replace the windows in Lower Hailey with similar windows with U-Value of .35 or less. The proposed solution at upper Hailey would be to replace approximately half of the windows with wall panels with a minimum R-19 insulation rating, and replace the remaining windows with double pane windows having a U-value of .35 or less.	Hailey ES	\$19,600	\$23,700	\$1,110	\$1,370	\$0	\$0	\$19,600	\$23,700	91%	137%	196%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
7.02-HAE	Carpet Replacement	All of the hallways at Hailey are carpeted, which does not help indoor air quality. Carpets tend to trap dirt and moisture, which can reduce indoor air quality.	Remove carpet from all the hallways and replace with polished concrete floors, commercial grade tile, or new low VOC carpet.	Hailey ES	\$230,500	\$279,000	\$0	\$0	\$0	\$0	\$230,500	\$279,000	N/A	N/A	N/A
7.03-HAE	Door Retrofit	Each classroom has an exterior door for the lower section of the building. The door hardware does not meet ADA requirements and the doors do not seal well resulting in a significant loss of the conditioned air in the classrooms to the outdoors.	The proposed solution is to replace the doors and frames with new equipment that will meet ADA requirements and effectively seal the area around the door to minimize the loss of the conditioned air from the space. Depending on the requirements of the local jurisdiction and the preference of the School District another option would be to remove these doors and seal the opening to match the existing insulation values of the structure.	Hailey ES	\$56,800	\$68,700	\$450	\$550	\$0	\$0	\$56,800	\$68,700	-74%	-67%	-59%
9.00-HAE	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Hailey ES	\$500	\$600	\$50	\$70	\$0	\$0	\$500	\$600	286%	378%	497%
9.01-HAE	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Hailey ES	\$19,400	\$23,500	\$380	\$470	\$0	\$800	\$18,600	\$22,700	-34%	-18%	2%
10.00-HAE	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Hailey ES	\$167,400	\$202,700	\$0	\$0	\$0	\$0	\$167,400	\$202,700	N/A	N/A	N/A
10.01-HAE	Fire Sprinkler Addition	This building currently does not have a fire sprinkler system	The proposed work is to install fire sprinkler system throughout the building.	Hailey ES	\$372,200	\$450,500	\$0	\$0	\$0	\$0	\$372,200	\$450,500	N/A	N/A	N/A
10.02-HAE	Kitchen Remodel	This school's kitchen is currently out dated and in need of updating and remodeling. The cooler and freezer are wooden as are many of the counters and shelving.	The proposed work is a complete remodel of the school's kitchen, including new cooler, freezer, counters, shelving, sinks, ovens, etc.	Hailey ES	\$239,100	\$289,400	\$0	\$0	\$0	\$0	\$239,100	\$289,400	N/A	N/A	N/A
10.03-HAE	Install Drop Ceiling	This building has several different types of ceilings. It would be beneficial from a maintenance and access stand point to install a drop ceiling throughout the building.	The proposed work is to install a T-bar drop ceiling where desired, and to replace any damaged part of an existing drop ceiling.	Hailey ES	\$510,600	\$618,000	\$0	\$0	\$0	\$0	\$510,600	\$618,000	N/A	N/A	N/A
11.00-HAE	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Hailey ES	\$12,800	\$15,400	\$0	\$0	\$0	\$0	\$12,800	\$15,400	N/A	N/A	N/A
1.01-HEE	Lighting (All)	The majority of the facility utilizes T12 lamps with magnetic ballasts.	The proposed installation is to replace the existing fixtures with T8 lighting with electronic ballasts. The gym and cafeteria have various lighting fixtures which can be changed to high-output lighting fixtures improving the lighting in these areas.	Hemingway ES	\$91,600	\$110,900	\$2,940	\$3,630	\$1,496	\$9,200	\$82,400	\$101,700	8%	34%	67%
1.02-HEE	Lighting Controls	The lighting controls are currently all manual light switches.	Each area should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Hemingway ES	\$22,700	\$27,400	\$770	\$950	\$0	\$2,800	\$19,900	\$24,600	15%	42%	77%
1.03-HEE	Day Lighting	The oldest classroom sections have minimal outdoor light from a small window cut in the exterior door.	The proposed solution to bring in more daylight into the older section of the building would be to add skylights at the peak of the roofline to daylight the hallway and then the class rooms through the large interior windows.	Hemingway ES	\$164,900	\$199,600	\$0	\$0	\$0	\$0	\$164,900	\$199,600	N/A	N/A	N/A
3.00-HEE	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets throughout. The urinals are a combination of 1.0 gpf and higher fixtures. The faucets use 2.0 gpm. There are eighteen (18) water closets, ten (10) urinals, and forty-four (44) faucets in the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding Kitchen faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm.	Hemingway ES	\$33,400	\$40,400	\$650	\$800	\$0	\$0	\$33,400	\$40,400	-35%	-19%	1%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.00-HEE	DDC Retrofit	Existing DDC that is connected to the Web Control front end. These controls provide good scheduled control but are not adaptable to occupancy sensors.	Install new DDC with the exact design based on the results of FIM 5.01. Occupancy sensors, DCV and cooling control will be included.	Hemingway ES	\$172,900	\$209,200	\$1,010	\$1,250	\$0	\$10,000	\$162,900	\$199,200	-80%	-76%	-69%
4.03-HEE	Economizer	This facility has heating and ventilating units for major common spaces. These have ventilation air but the economizers are not used to their potential.	The proposed solution is to add economizer controls to the new air conditioning installation under FIM 5.06 below.	Hemingway ES	\$12,000	\$14,600	\$0	\$0	\$0	\$0	\$12,000	\$14,600	N/A	N/A	N/A
4.04-HEE	Verdium	Based on the preliminary facility walk through there are two hundred and ninety-two (292) computers in the facility. There are nine (9) projectors, two (2) copy machines, and fifty-three (53) printers in the facility that are all connected to the IT network. All of these quantities should be confirmed with the School District's IT department.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Hemingway ES	\$6,500	\$7,800	\$1,250	\$1,540	\$0	\$2,900	\$3,600	\$4,900	553%	709%	910%
4.05-HEE	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Hemingway ES	\$7,000	\$8,500	\$400	\$500	\$0	\$300	\$6,700	\$8,200	95%	141%	201%
4.07-HEE	Vending Miser Install	The facility has one (1) cold drink vending machine.	The proposed solution is to install a device that will disconnect power to the lighting and compressors associated with the vending machine during periods when the area in front of the vending machine is not occupied. An occupancy sensor will be installed that will determine if the area in front of the machine is occupied.	Hemingway ES	\$700	\$800	\$90	\$120	\$0	\$100	\$600	\$700	396%	515%	667%
5.01-HEE	HVAC Retrofit	The facility currently has a combination of electric, hot water and natural gas heating and ventilation units. The facility has had four additions or remodels with the last ones using natural gas as the heating fuel. The majority of the existing equipment has exceeded the expected useful life expectancy.	The proposed solution is to install a new system that will provide heating, ventilation, and cooling to the facility. A new system will provide easier maintenance, increased occupant comfort, and improved ventilation delivery to the spaces. This FIM's savings includes DDC retrofit, demand control ventilation, economizer, and cooling addition (FIM 4.00, 4.02, 4.03, and 5.06).	Hemingway ES	\$981,500	\$1,188,100	\$6,840	\$8,450	\$0	\$0	\$981,500	\$1,188,100	-76%	-71%	-64%
5.06-HEE	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution will be dependent upon the systems determined through FIM 5.01 above. The addition of air conditioning will ultimately increase the energy consumption of this facility however will increase the occupant comfort. In the event that FIM 5.01 above is not selected there is the potential to install split system direct expansion cooling for each space as a stand alone measure.	Hemingway ES	\$241,900	\$292,800	-\$12,600	-\$15,560	\$0	\$0	\$241,900	\$292,800	N/A	N/A	N/A
5.07-HEE	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Hemingway ES	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.09-HEE	Solar Snow Melt	There is currently no snow melt system at this building, however, there is the need to have some sort of system to keep ice from forming on the walkways.	The proposed solution would be to add a snow melt system that would have hot water solar panels to provide about half of the heated water necessary to melt the snow.	Hemingway ES	\$72,300	\$87,500	\$460	\$570	\$0	\$0	\$72,300	\$87,500	-78%	-73%	-67%
7.02-HEE	Carpet Replacement	All of the hallways at Hemmingway are carpeted, which does not help indoor air quality. Carpets tend to trap dirt and moisture, which can reduce indoor air quality.	Remove carpet from all the hallways and replace with polished concrete floors, commercial grade tile, or new low VOC carpet.	Hemingway ES	\$252,400	\$305,600	\$0	\$0	\$0	\$0	\$252,400	\$305,600	N/A	N/A	N/A
7.03-HEE	Door Retrofit	Each classroom has an exterior door for the lower section of the building. The door hardware does not meet ADA requirements and the doors do not seal well resulting in a significant loss of the conditioned air in the classrooms to the outdoors.	The proposed solution is to replace the doors and frames with new equipment that will meet ADA requirements and effectively seal the area around the door to minimize the loss of the conditioned air from the space. Depending on the requirements of the local jurisdiction and the preference of the School District another option would be to remove these doors and seal the opening to match the existing insulation values of the structure.	Hemingway ES	\$79,500	\$96,200	\$710	\$880	\$0	\$0	\$79,500	\$96,200	-70%	-62%	-53%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
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					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
7.04-HEE	Covered Walkway	There are several areas surrounding this school that have icy areas due to roof drain run off and other snowmelt. This causes safety concerns with the children walking around the building.	The proposed solution is to add an architectural covered or enclosed walkway which would eliminate any ice build up on the current walkways.	Hemingway ES	\$118,300	\$143,200	\$0	\$0	\$0	\$0	\$118,300	\$143,200	N/A	N/A	N/A
9.00-HEE	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Hemingway ES	\$500	\$600	\$40	\$50	\$0	\$0	\$500	\$600	176%	242%	326%
9.01-HEE	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Hemingway ES	\$24,300	\$29,400	\$480	\$590	\$0	\$1,000	\$23,300	\$28,400	-34%	-18%	3%
10.00-HEE	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Hemingway ES	\$134,900	\$163,300	\$0	\$0	\$0	\$0	\$134,900	\$163,300	N/A	N/A	N/A
11.00-HEE	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Hemingway ES	\$12,000	\$14,500	\$0	\$0	\$0	\$0	\$12,000	\$14,500	N/A	N/A	N/A
1.01-SC	Lighting (All)	The majority of the facility utilizes T12 lamps with magnetic ballasts.	The proposed installation is to replace the existing fixtures with T8 lighting with electronic ballasts.	Silver Creek AS	\$7,500	\$9,100	\$2,970	\$3,660	\$217	\$1,000	\$6,500	\$8,100	1230%	1549%	1958%
1.02-SC	Lighting Controls	The lighting controls are currently all manual light switches.	Each area should be retrofit with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Silver Creek AS	\$2,300	\$2,800	\$50	\$60	\$0	\$400	\$1,900	\$2,400	-29%	-12%	10%
4.00-SC	DDC Retrofit	Three of four classrooms have programmable thermostats.	The proposed retrofit is to install new updated programmable thermostats that could control the new HVAC system and keep the old heating system as a backup. This will be able to provide scheduling and setbacks for the nights and weekends.	Silver Creek AS	\$6,500	\$7,900	\$40	\$50	\$0	\$1,600	\$4,900	\$6,300	-79%	-74%	-68%
4.04-SC	Verdium	Based on the preliminary facility walk through there are thirty-nine (39) desktop computers in the facility each with a single dedicated monitor. There are two (2) projectors, one (1) copy machines, and seven (7) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Silver Creek AS	\$900	\$1,100	\$160	\$200	\$0	\$300	\$600	\$800	501%	645%	830%
4.05-SC	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Silver Creek AS	\$1,400	\$1,600	\$70	\$90	\$0	\$0	\$1,400	\$1,600	86%	131%	188%
5.01-SC	HVAC Retrofit	The facility currently has four (4) forced air electric furnaces installed in the crawl space which heat the building with a dedicated thermostat for each furnace.	The proposed solution would be to add a variable refrigerant volume (VRV) heating and cooling system. The benefit is that this system would provide individual heating and cooling control in each of the different areas of the building, and it would have only one outdoor unit.	Silver Creek AS	\$96,800	\$117,200	\$710	\$880	\$0	\$0	\$96,800	\$117,200	-75%	-69%	-62%
5.06-SC	Cooling Addition	The facility currently does not have air conditioning in all spaces and the occupants are uncomfortable in August due to the outdoor conditions at that time of year.	The proposed solution is to install split system direct expansion cooling.	Silver Creek AS	\$46,900	\$56,700	-\$1,090	-\$1,340	\$0	\$0	\$46,900	\$56,700	N/A	N/A	N/A

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
9.00-SC	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Silver Creek AS	\$500	\$600	\$0	\$10	\$0	\$0	\$500	\$600	-45%	-32%	-15%
9.01-SC	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Silver Creek AS	\$7,300	\$8,800	\$140	\$170	\$0	\$300	\$7,000	\$8,500	-36%	-21%	-1%
10.00-SC	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Silver Creek AS	\$67,100	\$81,200	\$0	\$0	\$0	\$0	\$67,100	\$81,200	N/A	N/A	N/A
10.01-SC	Fire Sprinkler Addition	This building currently does not have a fire sprinkler system	The proposed work is to install fire sprinkler system throughout the building.	Silver Creek AS	\$31,500	\$38,200	\$0	\$0	\$0	\$0	\$31,500	\$38,200	N/A	N/A	N/A
11.00-SC	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Silver Creek AS	\$11,800	\$14,300	\$0	\$0	\$0	\$0	\$11,800	\$14,300	N/A	N/A	N/A
1.01-SS	Lighting (All)	The majority of the facility utilizes T12 lamps with magnetic ballasts.	The proposed installation is to replace the existing fixtures with T8 lighting with electronic ballasts.	Support Svcs	\$39,300	\$47,600	\$1,330	\$1,640	\$608	\$5,600	\$33,700	\$42,000	14%	41%	76%
1.02-SS	Lighting Controls	The lighting controls are currently all manual light switches.	Each area should be retrofitted with two (2) dual technology occupancy sensors that are wired in series with the existing light switches. Due to the building use, many of these office areas are vacant at various times throughout the day. Using an automated lighting control system would help limit the time the lights are on during the day when the spaces are unoccupied.	Support Svcs	\$9,700	\$11,700	\$420	\$520	\$0	\$1,800	\$7,900	\$9,900	47%	82%	127%
2.00-SS	Data Center UPS/Generator + Subpanel	Currently the data center does not have adequate redundant power in case of a power outage.	The proposed solution would be to add a generator and subpanel that would supply adequate power to the data center and cooling units for a determined amount of time.	Support Svcs	\$61,400	\$74,300	\$0	\$0	\$0	\$0	\$61,400	\$74,300	N/A	N/A	N/A
3.00-SS	Water Fixture Retrofit	The facility utilizes 3.5 gpf water closets throughout. The urinals are a combination of 1.0 gpf and higher fixtures. The faucets use 2.0 gpm. There are seven (7) water closets, two (2) urinals, and thirty-five (35) faucets in the facility.	The proposed installation is for new porcelain for all water closets designed to use 1.6 gpf. For water closets with flush valves new 1.6 gpf flush valves should be considered with a potential lower cost solution of retrofitting the existing flush valves to use 1.6 gpf. The proposed installation for the urinals is to re-use the existing porcelain and to replace the flush valves with 0.5 gpf flush valves with a potential lower cost solution of retrofitting the existing flush valves to use 0.5 gpf. The proposed solution for the faucets, excluding Kitchen faucets, is to install 0.5 gpm aerators where possible and replacing the remaining faucets with new faucets that will use 0.5 gpm.	Support Svcs	\$13,500	\$16,300	\$170	\$220	\$0	\$0	\$13,500	\$16,300	-55%	-45%	-31%
4.01-SS	DDC Optimization	The current DDC system has fixed MAU and HP loop control. The building is scheduled about 7am to 10pm, and has night time setback. Due to the variable use of this building, a typical schedule may not be the best fit.	The proposed work would incorporate occupancy sensor control of heat pumps into the existing controllers. This would allow the building to be more flexible, and reduce energy consumption when the building is unoccupied. The heat pump loop temperature could be allowed to reset based on building need as well.	Support Svcs	\$18,700	\$22,600	\$730	\$910	\$0	\$2,500	\$16,200	\$20,100	33%	65%	106%
4.04-SS	Verdium	Based on the preliminary facility walk through there are about fifty-six (56) desktop computers in the facility some with dual monitors. There are two (4) copy machines, and ten (10) printers in the facility that are all connected to the IT network. All of these quantities should be confirmed with the School District's IT department.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Support Svcs	\$1,300	\$1,500	\$230	\$290	\$0	\$500	\$800	\$1,000	539%	693%	889%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
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					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.05-SS	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isolate IDP-3050 Plug Load Control (or equal) system. The Isolate system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Support Svcs	\$10,900	\$13,200	\$630	\$780	\$0	\$500	\$10,400	\$12,700	95%	142%	202%
5.01-SS	HVAC Retrofit	The bus maintenance area is heated by gas fired unit heaters mounted near the ceiling. The ceiling in this area is about thirty feet high. The unit heaters are not designed to condition an area from that high, which causes the unit heaters to heat the highest air in the area before it heats the area where the occupants are located.	The proposed solution would be to lower each of the unit heaters, where possible, to a height of approximately fifteen feet to increase occupant comfort at the ground level.	Support Svcs	\$17,000	\$20,600	\$0	\$0	\$0	\$0	\$17,000	\$20,600	N/A	N/A	N/A
5.04-SS	Waste Oil Furnace/Boiler	The waste motor oil accumulated from regular bus maintenance is currently given away by the school district.	The proposed solution would be to add a waste oil furnace in the bus maintenance area, which would cleanly burn the waste oil to heat the space offsetting the natural gas currently used to heat the space.	Support Svcs	\$8,900	\$10,800	\$700	\$870	\$0	\$0	\$8,900	\$10,800	166%	230%	312%
5.05-SS	Data Center Cooling Addition	The data center does not have adequate cooling to keep the equipment at an ideal temperature.	The proposed solution would be to add a DX split cooling unit, and to configure the heat pump system to provide the first stage of cooling during the winter and the DX unit to provide the first stage of cooling during the summer. If the heat pump is used during the winter as the first stage, the heat removed from the data center can be redistributed to the other spaces that are requiring heat added to them.	Support Svcs	\$17,800	\$21,600	\$0	\$0	\$0	\$0	\$17,800	\$21,600	N/A	N/A	N/A
5.07-SS	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Support Svcs	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
8.00-SS	RCx	The Support Services building has over 30 pieces of mechanical equipment; half of which are heat pumps.	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Support Svcs	\$30,600	\$37,000	\$1,220	\$1,510	\$0	\$0	\$30,600	\$37,000	35%	67%	109%
9.00-SS	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Support Svcs	\$500	\$600	\$60	\$80	\$0	\$0	\$500	\$600	341%	447%	582%
9.01-SS	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining fifteen (15) CRT monitors with LCD monitors.	Support Svcs	\$3,700	\$4,400	\$70	\$80	\$0	\$100	\$3,600	\$4,300	-40%	-25%	-7%
10.00-SS	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Support Svcs	\$81,400	\$98,500	\$0	\$0	\$0	\$0	\$81,400	\$98,500	N/A	N/A	N/A
11.00-SS	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Support Svcs	\$11,800	\$14,300	\$0	\$0	\$0	\$0	\$11,800	\$14,300	N/A	N/A	N/A
1.00-WHS	Lighting (Gym)	Several high ceiling areas have pendant mount metal halide fixtures.	Proposed installation is to change out the high-bay metal halide fixtures with fixtures that use T-5 lamps and that have safety cages.	Wood River HS	\$75,400	\$91,300	\$2,390	\$2,950	\$144	\$4,300	\$71,100	\$87,000	7%	32%	65%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
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					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
1.02-WHS	Lighting Controls	The lighting controls are currently all manual light switches. With some occupancy sensors.	Each area should be retrofitted with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Wood River HS	\$10,800	\$13,100	\$900	\$1,110	\$0	\$400	\$10,400	\$12,700	180%	247%	333%
3.01-WHS	Irrigation Improvements	This site currently does have Maxicon irrigation control system.	The proposed solution would be to optimize the system by doing a water audit to adjust and optimize the weather based control.	Wood River HS	\$68,500	\$82,900	\$0	\$0	\$0	\$0	\$68,500	\$82,900	N/A	N/A	N/A
3.02-WHS	Field Turf Install	The football field is currently a grass field that is only used for home football games a few times per year. Installing field turf will reduce maintenance costs with the upkeep of the grass and will allow more use due to the durability of the field turf.	The proposed work is to install field turf on the high school football field.	Wood River HS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	N/A	N/A	N/A
4.01-WHS	DDC Optimization	Fixed loop temperature control, MAU control and Occ from schedule only.	Reset loop and MAU set point based on building need.	Wood River HS	\$26,700	\$32,300	\$3,410	\$4,210	\$0	\$2,500	\$24,200	\$29,800	331%	434%	567%
4.03-WHS	Economizer	This facility has air conditioning in all spaces. The economizers are not being used to their potential.	Dampers would be tuned up and economizer controls adjusted to maximize the economizer capability.	Wood River HS	\$10,700	\$13,000	\$0	\$0	\$0	\$0	\$10,700	\$13,000	N/A	N/A	N/A
4.04-WHS	Verdium	Based on the preliminary facility walk through there are five hundred and eighty-one (581) desktop computers in the facility each with a single dedicated monitor. There are several copy machines and one hundred and eight (108) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Wood River HS	\$12,900	\$15,600	\$2,480	\$3,070	\$0	\$5,800	\$7,100	\$9,800	551%	707%	907%
4.05-WHS	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Wood River HS	\$15,900	\$19,200	\$930	\$1,140	\$0	\$700	\$15,200	\$18,500	96%	143%	204%
5.02-WHS	Install VFD on HP loop pumps	The current pumps are scheduled to turn off at night, but if any area is calling for heating or cooling the pumps turn on, which causes them to run much longer at full capacity than desired.	Install a variable frequency drive on the heat pump loop pumps, to vary the flow depending on building requirements.	Wood River HS	\$93,700	\$113,400	\$9,040	\$11,170	\$0	\$3,600	\$90,100	\$109,800	226%	304%	404%
5.07-WHS	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Wood River HS	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
5.09-WHS	Solar Snow Melt	The current snow melt system uses natural gas to heat the water that heats the ground to melt the snow.	The proposed solution would be to add a system that would add hot water solar panels to provide about half of the heated water necessary to melt the snow.	Wood River HS	\$35,600	\$43,100	\$460	\$570	\$0	\$0	\$35,600	\$43,100	-56%	-46%	-32%
5.11-WHS	Heat Recovery for DOM HW	Currently the high school has a fair amount of domestic hot water usage during the school year. There are also times when the heat pump loop requires some cooling even on relatively cold days.	The proposed solution would be to add a water to water heat pump that would act as a first cooling stage and would remove heat from the heat pump loop and add it to the domestic hot water loop.	Wood River HS	\$41,200	\$49,900	\$720	\$890	\$0	\$0	\$41,200	\$49,900	-41%	-27%	-9%
8.00-WHS	RCx	Wood River High School has over 225 pieces of mechanical equipment, half of which are heat pumps.	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Wood River HS	\$99,500	\$120,500	\$5,680	\$7,020	\$0	\$0	\$99,500	\$120,500	93%	139%	198%

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- Group 1, Phase 1
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					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
9.00-WHS	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Wood River HS	\$500	\$600	\$90	\$120	\$0	\$0	\$500	\$600	561%	720%	923%
9.01-WHS	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining two hundred (200) CRT monitors with LCD monitors.	Wood River HS	\$48,500	\$58,700	\$960	\$1,180	\$0	\$2,000	\$46,500	\$56,700	-34%	-18%	3%
11.00-WHS	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Wood River HS	\$14,900	\$18,100	\$0	\$0	\$0	\$0	\$14,900	\$18,100	N/A	N/A	N/A
5.03-WRC	Biomass Central Plant	This campus is set up very well for a central plant to heat the Community Center, the District Support Building, and the High School.	The proposed solution would be to install a central woody, biomass-fired boiler plant and to pipe hot water to the facility for use in heating the spaces. Various options will be analyzed to determine the best Total Cost of Ownership approach to provide hydronic heating. -- There is the possibility at each school to use ground water to heat and cool the buildings with a water source heat pump loop. The proposed solution would be determined by the temperature and quantity of the water found near the building site. If it is a low temperature a heat pump loop system would work well. If it is a high temperature a hot water loop would be the best solution.	Wood River HS Campus	\$6,768,800	\$8,193,800	\$57,030	\$70,450	\$0	\$0	\$6,768,800	\$8,193,800	-72%	-65%	-56%
6.00-WRC	Waste Management	The waste management services uses a standard rate based on the number of collections and the size of the container regardless of the amount of waste actually collected.	The proposed solution is to add a trash compactor.	Wood River HS Campus	\$57,100	\$69,100	\$5,620	\$6,940	\$0	\$0	\$57,100	\$69,100	232%	312%	414%
1.00-WMS	Lighting (Gym)	Several high ceiling areas have pendant mount metal halide fixtures.	Proposed installation is to change out the high-bay metal halide fixtures with fixtures that use T-5 lamps and that have safety cages.	Wood River MS	\$40,200	\$48,700	\$1,220	\$1,510	\$211	\$4,600	\$35,600	\$44,100	3%	27%	59%
1.02-WMS	Lighting Controls	The lighting controls are currently all manual light switches.	Each classroom should be retrofitted with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Wood River MS	\$8,600	\$10,400	\$330	\$410	\$0	\$400	\$8,200	\$10,000	30%	62%	102%
4.01-WMS	DDC Optimization	Fixed loop temperature control, MAU control and Occ from schedule only.	Reset loop and MAU set point based on building need.	Wood River MS	\$21,900	\$26,400	\$980	\$1,210	\$0	\$2,500	\$19,400	\$23,900	52%	88%	134%
4.02-WMS	Demand Control Ventilation	The ventilation air in this building is supplied by both MAUs and HVUs. These units currently bring in a fixed minimum outside air regardless of building occupancy level.	The proposed work would be to install IAQ sensors and regulate the minimum ventilation levels based on IAQ need.	Wood River MS	\$29,100	\$35,200	\$1,330	\$1,650	\$0	\$0	\$29,100	\$35,200	55%	92%	140%
4.03-WMS	Economizer	This facility has air conditioning in all spaces. The economizers are not being used to their potential.	The proposed work would include tuning up the dampers and adjusting the economizer controls to maximize the economizer capability.	Wood River MS	\$8,000	\$9,700	\$300	\$370	\$0	\$0	\$8,000	\$9,700	26%	56%	95%
4.04-WMS	Verdium	Based on the preliminary facility walk through there are four hundred and eighty-three (483) desktop computers in the facility each with a single dedicated monitor. There are several copy machines and eighty-two (82) printers in the facility that are all connected to the IT network.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Wood River MS	\$10,700	\$12,900	\$2,060	\$2,550	\$0	\$4,800	\$5,900	\$8,100	554%	710%	911%

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FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.05-WMS	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isolate IDP-3050 Plug Load Control (or equal) system. The Isolate system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Wood River MS	\$13,300	\$16,100	\$770	\$960	\$0	\$600	\$12,700	\$15,500	97%	144%	205%
5.02-WMS	Install VFD on HP loop pumps	The current pumps are scheduled to turn off at night, but if any area is calling for heating or cooling the pumps turn on, which causes them to run much longer at full capacity than desired.	Install a variable frequency drive on the heat pump loop pumps, to vary the flow depending on building requirements.	Wood River MS	\$63,000	\$76,300	\$9,040	\$11,170	\$0	\$3,600	\$59,400	\$72,700	384%	500%	649%
5.07-WMS	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Wood River MS	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
6.00-WMS	Waste Management	The waste management services uses a standard rate based on the number of collections and the size of the container regardless of the amount of waste actually collected.	The proposed solution is to add a trash compactor, which would decrease the quantity of pickups required.	Wood River MS	\$57,100	\$69,100	\$2,780	\$3,440	\$0	\$0	\$57,100	\$69,100	65%	104%	155%
8.00-WMS	RCx	Wood River Middle School has approximately 150 pieces of mechanical equipment; most of which are heat pumps	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Wood River MS	\$66,900	\$81,000	\$2,680	\$3,310	\$0	\$0	\$66,900	\$81,000	35%	68%	109%
9.00-WMS	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Wood River MS	\$500	\$600	\$80	\$100	\$0	\$0	\$500	\$600	451%	583%	753%
9.01-WMS	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining CRT monitors with LCD monitors.	Wood River MS	\$19,400	\$23,500	\$380	\$470	\$0	\$800	\$18,600	\$22,700	-34%	-18%	2%
10.00-WMS	Security Upgrades	There are currently no advanced security features at this site.	Security upgrades for schools include costs for access controls, building security and video surveillance based on rough estimate quantities.	Wood River MS	\$231,000	\$279,600	\$0	\$0	\$0	\$0	\$231,000	\$279,600	N/A	N/A	N/A
11.00-WMS	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Wood River MS	\$14,300	\$17,300	\$0	\$0	\$0	\$0	\$14,300	\$17,300	N/A	N/A	N/A
1.00-WES	Lighting (Gym)	Several high ceiling areas have pendant mount metal halide fixtures.	Proposed installation is to change out the high-bay metal halide fixtures with fixtures that use T-5 lamps and that have safety cages.	Woodside ES	\$17,300	\$20,900	\$320	\$400	\$43	\$1,400	\$15,900	\$19,500	-37%	-22%	-2%
1.02-WES	Lighting Controls	The lighting controls are currently manual light switches with a scheduled sweep on parts of the building.	Each classroom should be retrofitted with two (2) dual technology occupancy sensors that are wired in series with the existing light switches.	Woodside ES	\$26,700	\$32,400	\$880	\$1,090	\$0	\$2,000	\$24,700	\$30,400	11%	38%	72%
3.01-WES	Irrigation Improvements	This site currently does have Maxicon irrigation control system.	The proposed solution would be to optimize the system by doing a water audit to adjust and optimize the weather based control.	Woodside ES	\$25,300	\$30,700	\$0	\$0	\$0	\$0	\$25,300	\$30,700	N/A	N/A	N/A
4.01-WES	DDC Optimization	Fixed loop temperature control & MAU control.	Reset loop and MAU set point based on building need.	Woodside ES	\$24,300	\$29,400	\$980	\$1,220	\$0	\$2,500	\$21,800	\$26,900	37%	70%	112%
4.02-WES	Demand Control Ventilation	The ventilation is supplied by both MAUs and HVUs. These units currently bring in a fixed minimum outside air regardless of building occupancy level.	Install IAQ sensors and regulate the minimum ventilation levels based on IAQ need.	Woodside ES	\$5,700	\$6,900	\$120	\$150	\$0	\$0	\$5,700	\$6,900	-28%	-11%	11%

**Scenario - A - Energy Conservation Measures
- Group 1, Phase 1
Rough Order of Magnitude FIM Matrix (DRAFT)**

This information is proprietary and confidential

FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
4.04-WES	Verdium	Based on the preliminary facility walk through there are fifty-four (54) desktop computers in the facility each with a single dedicated monitor. There are two (2) copy machines and nineteen (19) printers in the facility that are all connected to the IT network. All of these quantities should be confirmed with the School District's IT department.	The proposed solution is to install the Verdium software on the School District's server. The Software program will allow the IT department to set up the power on/off, sleep mode, and hibernation modes through custom protocols to manage the power consumption of the networked PC's and associated devices.	Woodside ES	\$3,800	\$4,500	\$710	\$880	\$0	\$1,600	\$2,200	\$2,900	547%	702%	900%
4.05-WES	Plug Load Control	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment and which items, through occupant training, can be un-plugged when not in use (FIM 9.00 below). The devices that can automatically be de-energized would be plugged into a Watt Stopper Isole IDP-3050 Plug Load Control (or equal) system. The Isole system uses an occupancy sensor to determine if the area adjacent to the device is occupied and then disconnects power to that device when there is no occupancy detected for a pre-set and adjustable timeframe.	Woodside ES	\$9,800	\$11,900	\$570	\$700	\$0	\$400	\$9,400	\$11,500	95%	141%	201%
5.02-WES	Install VFD on HP loop pumps	The current pumps are scheduled to turn off at night, but if any area is calling for heating or cooling the pumps turn on, which causes them to run much longer at full capacity than desired.	Install a variable frequency drive on the heat pump loop pumps, to vary the flow depending on building requirements.	Woodside ES	\$61,400	\$74,300	\$6,030	\$7,450	\$0	\$2,400	\$59,000	\$71,900	232%	311%	413%
5.07-WES	Solar Array (20kW)	There are currently no renewable energy components at this site.	The proposed solution would be to add 20kW of PV solar panels at each school site, to offset electrical usage. This measure will be implemented if new technology and various incentives can show a twenty year payback.	Woodside ES	\$323,000	\$391,000	\$1,830	\$2,260	\$0	\$0	\$323,000	\$391,000	-81%	-76%	-70%
8.00-WES	RCx	Woodside Elementary School has over 100 pieces of mechanical equipment; half of which are heat pumps.	For facilities that were never commissioned or considerable time has elapsed since commissioning, retrocommissioning (RCx) could provide impressive benefits, such as improving building operations and tenant comfort, reducing energy use, and increasing equipment life.	Woodside ES	\$54,900	\$66,400	\$2,040	\$2,520	\$0	\$0	\$54,900	\$66,400	25%	56%	94%
9.00-WES	Plug Load Reduction	The facility has a number of devices that are always "plugged in" and consume energy. Some of these devices have a dedicated power switch, however most of these devices still consume some electricity even while in the "off" position.	The proposed solution is to work with the facility and district staff to determine which items can have an automated device installed that will de-energize the equipment (FIM 4.05 above) and which items, through occupant training, can be un-plugged when not in use. The implementation of this measure will be a periodic training of the staff and potentially the implementation of a reporting structure for the custodial staff to identify when equipment is left plugged in when the spaces are not occupied and the equipment is not needed.	Woodside ES	\$500	\$600	\$60	\$70	\$0	\$0	\$500	\$600	286%	378%	497%
9.01-WES	CRT to LCD replacement	The IT department has made an effort to purchase LCD monitors with new computer purchases, however each building still has some CRT monitors which consume more power than LCD monitors.	The proposed solution is to replace the remaining fifty (50) CRT monitors with LCD monitors.	Woodside ES	\$12,200	\$14,700	\$240	\$290	\$0	\$500	\$11,700	\$14,200	-35%	-19%	1%
11.00-WES	LEED-EB	This building currently has no certification.	This measure is the labor cost and application fees to do the documentation required to certify a building with the USGBC.	Woodside ES	\$12,000	\$14,500	\$0	\$0	\$0	\$0	\$12,000	\$14,500	N/A	N/A	N/A
	Totals for building			Bellevue ES	\$3,762,000	\$4,553,900	\$2,160	\$2,660	\$497	\$22,200	\$3,739,800	\$4,531,700			
	Totals for building			Carey Campus	\$2,632,400	\$3,186,500	\$36,250	\$44,780	\$0	\$0	\$2,632,400	\$3,186,500			
	Totals for building			Carey ES	\$2,082,300	\$2,520,600	\$3,500	\$4,330	\$746	\$22,400	\$2,059,900	\$2,498,200			
	Totals for building			Carey Gym	\$221,700	\$268,200	-\$4,610	-\$5,680	\$0	\$4,900	\$216,800	\$263,300			
	Totals for building			Carey HS	\$545,300	\$660,000	\$8,590	\$10,630	\$228	\$11,200	\$534,100	\$648,800			
	Totals for building			Comm. Campus	\$3,415,900	\$4,135,100	\$15,040	\$18,620	\$1,323	\$26,200	\$3,389,700	\$4,108,900			
	Totals for building			District Office Building	\$80,400	\$97,300	\$700	\$880	\$0	\$2,400	\$78,000	\$94,900			
	Totals for building			Halley ES	\$4,461,100	\$5,400,000	\$38,980	\$48,170	\$1,137	\$32,400	\$4,428,700	\$5,367,600			
	Totals for building			Hemingway ES	\$2,752,300	\$3,331,400	\$4,870	\$6,030	\$1,496	\$26,300	\$2,726,000	\$3,305,100			
	Totals for building			Silver Creek AS	\$280,500	\$339,500	\$3,050	\$3,780	\$217	\$3,600	\$276,900	\$335,900			

Scenario - A - Energy Conservation Measures
 - Group 1, Phase 1
 Rough Order of Magnitude FIM Matrix (DRAFT)

This information is proprietary and confidential

FIM #	FIM Name	Description (Existing Conditions)	Description (Proposed Conditions)	Building	Budget *		Annual Utility Savings ***		Annual Operational Savings	Potential Utility Rebate **	Net Customer Cost		20 year Return on Investment		
					Min	Max	Min	Max			Min	Max	5% escalation	7% escalation	9% escalation
	Totals for building			Support Svcs	\$649,500	\$786,000	\$7,390	\$9,160	\$608	\$11,000	\$638,500	\$775,000			
	Totals for building			Wood River HS	\$877,800	\$1,062,700	\$28,890	\$35,690	\$144	\$19,300	\$858,500	\$1,043,400			
	Totals for building			Wood River HS Campus	\$6,825,900	\$8,262,900	\$62,650	\$77,390	\$0	\$0	\$6,825,900	\$8,262,900			
	Totals for building			Wood River MS	\$907,000	\$1,097,800	\$23,780	\$29,410	\$211	\$17,300	\$889,700	\$1,080,500			
	Totals for building			Woodside ES	\$576,900	\$698,200	\$13,780	\$17,030	\$43	\$10,800	\$566,100	\$687,400			
Totals for Selected FIMs					\$30,071,000	\$36,400,100	\$245,020	\$302,880	\$6,650	\$210,000	\$29,861,000	\$36,190,100			

* Project costs for Sections B, C, and E of Table 4.1 are divided among individual FIMs proportional to each FIM's Section A cost. Therefore the budget prices shown for individual FIMs are approximate and shown for reference only.

If individual FIMs are dropped from or added to the project, the project cost will not decrease or increase by exactly the dollar amount shown in this table.

** Utility rebate is contingent on utility company funding and final approval. Values are shown for reference only.

*** With the exception of the Lighting Heat Penalty / Cooling Credit, ROM savings do not account for interactive effects between other measures. This is because McKinstry doesn't yet know which measures the client will ultimately choose to implement. For this reason each calculation is treated as a stand-alone calculation. After the final scope of the project has been determined, McKinstry will recalculate the measures for interactive effects.