COMPREHENSIVE UTILIZATION STUDY OF CUMBERLAND SECONDARY SCHOOLS

ALLEGANY HIGH SCHOOL
FORT HILL HIGH SCHOOL
CAREER TECHNOLOGY HIGH SCHOOL
BRADDOCK MIDDLE SCHOOL
WASHINGTON MIDDLE SCHOOL

ALLEGANY COUNTY PUBLIC SCHOOLS, MD

VOLUME II – SUPPORTING DATA

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Insight for Education

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EXECUTIVE SUMMARY

Allegany County Public Schools have gone through over a decade of methodical facility changes under a focused, long-range plan by replacing and renovating school facilities to accommodate changing student populations and programs. With the completion of Mountain Ridge High School, the next step for capital improvements was ready for review and confirmation. Braddock Middle School and Washington Middle School, along with several elementary projects have been awaiting their turn.

Recent change in economic climate, however, along with continued decrease and stabilization in enrollment at the secondary level and renewed concern for an aging Allegany High School was cause for ACPS to look more closely at the implications of not only building condition, but also enrollment related to adequately serving secondary students and their families in Cumberland City for future generations.

The purpose of this Comprehensive Utilization Study of Cumberland Secondary Schools for Allegany County Public Schools is to provide information and recommendations for subsequent decisions of the Board related to the development of a long-range capital improvement plan for secondary schools in the City of Cumberland.

Eperitus, LLC was contracted to lead the study, which consists of two specific components: 1) data gathering and analysis relating to building condition and educational adequacy, enrollment projections, and capacity and utilization and 2) facilitating the work of a Community Resource Committee in developing and evaluating implications of options for the secondary schools in the City of Cumberland, and providing recommendations to the Superintendent and Board of Education regarding long-range capital improvement priorities.

The following report reflects these two component parts, with the resulting Committee recommendations.

PROJECT FOCUS AND GOALS

Project Focus:

A comprehensive assessment of the secondary schools in the City of Cumberland

- Allegany High School
- Fort Hill High School
- Center for Career and Technical Education (CCTE)
- Braddock Middle School
- Washington Middle School

The results of the study will provide information and recommendations for subsequent decisions of the Board related to the development of a long-range capital improvement plan for the secondary schools in the City of Cumberland.

Project Goals:

- Accommodating current and future educational programs and services based upon the projected enrollment for 2015
- Maintaining safe and healthy schools, which enrich the educational experience for all students
- Providing current and future programs and services in the most cost efficient and effective manner, maximizing state funding opportunities
- Maximizing the utilization of school facilities which includes the regular school day use, after-hours use and community use
- Providing equitable educational course offerings and experiences, both curricula and extra-curricular, for all middle school and high school students in their respective schools
- Engaging a Community Resource Committee in the process of evaluation options using parameters based on the Project Goals that will provide recommendations to the Superintendent and Board of Education regarding long-range capital improvement priorities.

ASSESSMENT OF BUILDING CONDITION

Background

Five Allegany County Public Schools were visited on October 14 and 15, 2009 by the Eperitus team of facility planners, mechanical, electrical, plumbing, and structural engineers, architect, energy management specialist, and technology network design specialists. The five schools as determined by Allegany County were: Braddock Middle School, Washington Middle School, Allegany High School, Fort Hill High School, and the Center for Career and Technical Education.

A walk through of approximately two hours at each facility produced observations and recommendations relative to the condition of each building. The major areas that were examined included: building envelope, mechanical, electrical, plumbing systems, technology infrastructure, energy management, and site.

The findings and recommendations for each school are detailed on the follow pages. A list of overall observations and a summary condition matrix are provided at the end of the building narratives.

Allegany High School

Allegany High School has approximately 174,000 square feet housed in a building originally constructed in the 1925 with major additions in 1933, 1940 and 1957 and 1995. The facility, with the exception of the 1957 addition had a major renovation in 1982.

The 11-acre site has an ADA/ bus drop of at the east side of the building built in 1999. Parking is across the street, which may not be safe for pedestrians. A parent/student drop-off and short-term parking area was added at the front of the school in 2009. Modifications have been made to make the site and building accessible. An elevator, ramps and many chair lifts makes accommodation, but accessibility is still difficult throughout the facility. The exterior ramps are not weather protected and could be slippery in bad weather.

The roofing was replaced in 1998, and should be in good condition for another ten years. The windows are in good condition, but do not have insulated double pane glass. Doors throughout show age and many need upgrade and ADA hardware.

The older sections of the building envelope need brick repair and re-pointing. Most of the restrooms are serviceable but are in need of modernization. Some restrooms have been modified, but they are not fully ADA accessible.

ELECTRICAL SYSTEMS

Description of Systems

Electric service to the building is 480 volts, 3-phase, and terminates in a 1600 amp main switchboard with one (1) main breaker device. Breakers are located in distribution sections of the switchboard for feeding multiple panelboards throughout the school. This gear and several other branch circuit panelboards are circa 1982 and appear to be in good condition. There are also several other panelboards and electrical distribution gear throughout the school that are original to the 1957 addition. This original gear, though in working condition and well maintained, has reached the end of its useful life. Replacement parts are not readily available for this gear and its reliability and accuracy for circuit protection may be questionable. An emergency generation system is installed in the school to feed emergency and life safety loads. This system is comprised of a 480 volt, 3-phase indoor natural gas 55KW generator and transfer switch, both by Onan.

Lighting throughout the school is comprised of many different fluorescent type fixtures, incandescent fixtures, and fixtures with high intensity discharge lamps. The majority of the fluorescent lamps being used are T8 type. Compact fluorescent lamps are being

used in many fixtures where incandescent lamps have been retrofitted. A portion of the lighting in the 1957 addition remains original to the building construction. The majority of lighting in the school was replaced or updated through a retrofit program sponsored by the electrical power company in 1990. Some of this lighting has been installed within the past few years and is in new condition. The remainder of the lighting (that is not original) has been replaced. However, a portion of this replaced lighting is reaching the end of its useful life.

- Lighting in classroom spaces consists of recess mounted 2'x4' fluorescent fixtures with acrylic diffusers. Lighting levels in classroom spaces are marginal where lamps have been removed during the retrofit program.
- The kitchen and cafeteria contain recess mounted 2'x4' fluorescent fixtures with acrylic diffusers. These fixtures are in fair to poor condition, and lighting levels in the kitchen are not adequate for that type space.
- Locker rooms, secondary corridors, small offices and some utility areas contain surface mounted round fixtures with opal lenses or recess type square fixtures. These fixtures are original to the building. Some of these fixtures have been retrofitted with compact fluorescent lamps; the remainder still utilizes incandescent lamps.
- Lighting in main corridors consists of recess mounted 2'x4' fluorescent fixtures with acrylic diffusers, surface mounted 1'x4' fluorescent fixtures with acrylic wrap-around diffusers, recess mounted 12"x12" fixtures with glass diffusers, surface mounted fluorescent fixtures with drop opal lenses, and a number of other type fixtures. A portion of these fixtures are in poor condition. However, the remainder of these fixtures, i.e. – most 2'x4' and 1'x4' fixtures, are in good condition.
- Lighting in the library consists of recess mounted 2'x4' parabolic fluorescent fixtures. These fixtures are in new condition and provide adequate lighting levels (except in book aisle areas).
- The gymnasium contains high-bay type fixtures with metal halide lamps and acrylic lenses. These fixtures provide marginal to adequate lighting levels in this space.
- The auditorium and stage area contains recess mounted incandescent fixtures, pendant mounted incandescent fixtures, and stage lighting fixtures that were installed as part of the 1982 renovation. All of the fixtures in this area appear functional, but have reached the end of their useful life.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school; however,

some spaces do have alternate or single-multiple row type switching arrangements. No automatic lighting controls are present.
Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting. Exit signs consist of both incandescent type as well as LED type, both with battery back-up. Building mounted exterior lighting consists of wall-pack type fixtures with high intensity discharge lamps. Many exit signs, wall-mounted battery pack fixtures, and building mounted fixtures are either original to the building's construction or are very dated and have reached the end of their useful life.

Receptacles located throughout the building are 120V-20A. Many receptacles are original to the building construction. Additional receptacle devices have been added in various locations throughout the school. In locations where devices have not been added, the quantity of receptacles is not adequate for school type use.

Deficiencies Noted

Due to the age of the original electrical distribution gear, its reliability and accuracy in providing overcurrent protection may be questionable. Some National Electric Code (NEC) violations exist with the electric distribution gear, i.e. – clearances required do not exist in some cases.
In many locations throughout the school where original light fixtures remain installed, the lighting level in these areas is not adequate or marginal at best. Many of these fixtures, even though they contain fluorescent lamps, have lenses that have been discolored, which adversely affects the light output. A portion of other fixtures throughout the school have been replaced, but these fixtures are now dated and are reaching the end of their useful life.

Emergency egress lighting throughout the building is not adequately spaced in many locations, not providing the required egress illumination in the case of a loss of power. Also, several exit signs are either not working or their illumination levels are not adequate.

Recommended Improvements

- Replace all electrical distribution gear that was not replaced as part of the 1982 renovation.
- Perform a major lighting upgrade throughout the building.
- Install occupancy sensors and photocells throughout the school for control and energy efficiency.

- Lighting installed as a part of the 1982 renovation would be assessed on a space by space basis. Lighting that was installed in the renovation of the science labs and library could remain in operation.
- Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights.
- Replace building mounted light fixtures with fluorescent type wall pack fixtures that would be controlled via a direct digital control system.
- Replace exit signs throughout the building.
- Replace and supplement existing emergency egress lighting with additional wall mounted battery pack fixtures.
- Rectify all previously noted existing code violations.

HVAC SYSTEMS

Description of Systems

Building heat is provided from two separate boiler plants within the building. The gymnasium wing (including the band area) is served by two coal-fired, steam boilers. Steam is piped to coils and convectors throughout this area. Building heat is provided to the remainder of the building from a single coal-fired, hot water boiler. Hot water is distributed to areas served by two base mounted pumps (duty/standby). A steam-to-water heat exchanger is installed to provide redundancy for the hot water boiler; however, the steam boilers serving the heat exchanger have been abandoned.
There is no central cooling source.

- In general, the classrooms are heated by heating-only unit ventilators located below windows on exterior walls. Cooling is typically not provided to classrooms except where residential type window air conditioning units have been installed.
- The recently constructed (approximately 1995) science labs are served by rooftop heating and ventilating (H&V) units with hot water heating coils. The fume exhaust hoods are provided with make-up air connections on the front face of the hood.
- The kitchen, cafeteria, and media center are each served by rooftop H&V units with hot water heating coils.
- The gymnasium is served by two indoor H&V units located within the roof structure of the gymnasium. These units are equipped with steam heating coils.
- The band wing is served by an indoor H&V unit located in the boiler room. This unit is equipped with a steam heating coil.
- The auditorium is served by two indoor H&V units located in mechanical rooms below the stage. These units are equipped with hot water coils.

- The administrative area is heated by hot water convectors. Selected offices have through-wall a/c units with hot water heating coils, others are provided with residential type window air conditioning units.
- The shop area is provided with a dust collection system and make-up air unit with hot water heating coil.
- The two steam boilers and other equipment serving the gymnasium wing appear to be original to the 1957 addition. The majority of the remaining equipment appears to have been installed during renovations that occurred in the early 1980's.
- HVAC controls are pneumatic.

Deficiencies Noted

The air handling units serving the auditorium are located in small mechanical rooms below the stage (adjacent to the dressing rooms). Outside air from the mixing plenum is drawn through an open ended heating coil. Air from the room is then drawn through the fan and supplied to the space. This results in a condition where the mechanical room serves as a plenum. This is not prohibited by current code; however, all items installed in the space shall be noncombustible. These spaces cannot be utilized for storage.

The majority of the building is served by a single boiler. There is no redundancy for building heat in the areas served by the single boiler (all areas of the school except the gymnasium wing).

Indications are that the age of most of the major equipment is approximately 30 years, with the equipment in the gymnasium wing and auditorium wing older. The condition of the equipment appears to range between poor and fair. It appears as though the coal boilers have been well maintained and are retubed on a regular schedule. ASHRAE estimates that the statistical service life for equipment of this type would be in the range of 25-35 years and pneumatic controls approximately 20 years.

Recommended Improvements

- Combustible materials should not be stored in spaces that serve as plenums (similar to those serving the auditorium). Should one of these items begin to the burn, smoke would be discharged into the space served by the HVAC unit.
- Consideration should be given to replacing one of the abandoned boilers in the auditorium wing to supplement and provide redundancy for the hot water boiler serving the majority of the building.
- A complete HVAC renovation of the facility is warranted. The existing systems should be removed and replaced with new systems. Many factors would influence

the type of system that might best serve the school. Based on information available at this time, it might be expected that a four pipe VAV system would be recommended. Classroom wings would be provided with central, variable air volume (VAV) systems consisting of air handling units with chilled water cooling coils and hot water heating coils to provide supply air to VAV boxes located in the spaces to allow for individual temperature control of the space or zone served. The cafeteria, kitchen, gymnasium, and similar spaces would each be served by a single zone air handling unit incorporating demand control ventilation. Ventilation air would be introduced at the air handling units. Heat would be supplied by multiple boilers and heating water would be pumped to coils located throughout the building as well as areas requiring baseboard heat. Central cooling would be provided by an air or water cooled chiller and chilled water would be pumped to coils located throughout the building. The systems would be controlled by the latest generation direct digital control system to provide safe, automated control of all systems and management of energy conservation functions.

PLUMBING SYSTEMS

Description of Systems

The visible sanitary waste and vent system is a combination of cast iron sanitary waste and vent and galvanized steel vent piping and appears to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The exposed science laboratory waste piping is acid resistant flame retardant polypropylene. The waste from the laboratories passes through a neutralization device prior to discharging into the public sanitary sewer system. The roof drainage system for the building is composed of a combination of thru wall roof scuppers with exterior downspouts having cast iron boots and roof drains with interior water conductors that extend below the floor. The roof drainage system appears to be working satisfactorily, but the condition of the system is unknown. There is no indication of repairs to the exposed piping some of which was replaced as part of the 1998 roof replacement project.

The gas meter is located at the front entrance into the building. The gas service extends thru the building and serves three gas fired water heaters, gas fired generator, cooking equipment in the kitchen, and science laboratory outlets. The gas piping system is constructed of black steel and is in working condition. The exposed gas piping is not identified.

The vocational shops are equipped with compressed air supplied by one air compressor. Shop welding gasses are supplied from portable tanks.
There are two cold water services for the building. One 4" water service with 4" water meter enters the building in a space adjacent the auditorium stage. The other water service of unknown size enters the front of the building at the gymnasium. Neither of the cold water services is equipped with a backflow preventer. The domestic water systems consist of cold water, hot water and hot water circulating piping constructed of copper. The hot water circulating pumps are cast iron. The domestic hot water for the gymnasium side of the building is being generated by a gas fired water heater, appearing to have considerable age, connected to an un-insulated vertical steel storage tank located in the original building boiler room. The material or condition of the storage tank lining is unknown. Hot water for the cafeteria and adjacent spaces is being generated by two gas fired water heaters, each heater having an insulated storage tank. The water heaters and storage tanks appear to be in good condition and are operating satisfactorily. The water piping connected to the water heaters is partially un-insulated. Hot water for the auditorium wing is being generated by a 120 gallon electric water heater. The domestic water systems appear to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The plumbing fixtures consist of a combination of vitreous china floor mounted and wall mounted flush valve water closets; vitreous china wall mounted urinals with a combination of ¾" and 1" flush valves; a combination of cast iron wall hung, vitreous china wall hung, and vitreous china countertop mounted lavatories. The boys' locker room is provided with a terrazzo semi-circular wash fountain. The boys' showers are exposed two handle type with chrome finish. The girls' locker room was unavailable for inspection due to a sports event. Plumbing fixtures appear to be as installed at the time of construction and are in good condition. Some flush valves show wear but are functioning properly. The water closets and urinals do not appear to comply with present water consumption requirements. Hot water is available to all lavatories. Toilets throughout the facility are handicapped accessible but may not comply with present accessibility standards. Accessible plumbing facilities are not provided in the boys' locker room.

Deficiencies Noted

The cold water services are not equipped with a backflow preventer.

The water closets and urinals do not appear to comply with present water consumption requirements.

FIRE PROTECTION SYSTEMS

Description of Systems

The building is equipped with a partial sprinkler system with heads located on the stage, in the main office and cafeteria. The fire protection water service is connected to the 4" domestic service located adjacent to the Auditorium stage. The fire protection system supply has an OS&Y gate valve and wafer check valve with flow switch at the point of connection to the cold water service. Some of the stairways have standpipes. It is unknown if the standpipes are connected to the sprinkler system but the assumption is the standpipes and sprinkler system are interconnected. A fire department connection is located on the front of the building near the main entrance.

Deficiencies Noted

There is no backflow preventer separating the fire service and domestic water service.

There is potential for contamination of the public domestic water supply in the event the fire department connection is utilized by the fire department.

TECHNOLOGY INFRASTRUCTURE

Description of Infrastructure

The high school is supported by a wireless network (microwave ring) supplied by Allegany County Public Schools. Internally, the school uses 62.5/125 micron, multimode fiber optic cable between the MDF and the IDFs. The horizontal cable from the MDF or IDFs to the workstation locations is category 5 (Systimax) data cable. Voice horizontal cable is generally category 5 Systimax cable as well and the voice system is Voice over IP (VoIP). Analog cards within the VoIP system provide the analog requirements within the building. Equipment racks are generally 2-post, 7' equipment racks; however, the school is converting to 4-post racks in the MDF to support server equipment as well as standard network components. The servers and other mission critical equipment are being supported by APC 3000 watt uninterruptible power supplies.

The school uses streaming video to the classrooms over the existing network from a Safari video distribution server. Allegany High School also has a coax video distribution system installed for CATV access to the classrooms. Most classrooms have approximately 5 data drops in them with the exception of the labs. Labs have a data switch installed in the room in a remote wall cabinet and wiring is direct from the switch to the wall outlets. The school has wireless access points (WAPs) installed which

provide adequate coverage for the public areas. They also have mobile computing carts with an additional WAP and 15 or more laptop PCs on each cart. The WAPs are secured with both WPA and WEP security systems and access is controlled from a centralized MAC address authentication data base. All WAPs are set up as "G" radios (54 mbps).

Deficiencies noted:

Equipment racks are not grounded. Conduits do not have bushing installed on them. Some IDFs are very warm.

Recommended improvements:

- Ground all racks to a unified building ground to prevent differences in potential and to protect personnel.
- Install bushing on conduits if additional cables are going to be pulled through them. This will protect the jacket of the cable from cuts, scrapes, and other damage to the cable from the metallic conduits.
- Ensure adequate ventilation in all closets.
- Ensure that all closets or remote cabinets are connected to the MDF by fiber optic cable to maximize speed, security, and prevent interference. Consider upgrading the fiber optic cable to single mode fiber which can provide 10 gig backbone speeds.

ENERGY

Description of Energy

Allegany High School was originally built in 1925 and has had four additions added during the following years, 1933, 1940, 1957, and 1995. The school was renovated in 1982 with the exception of the 1957 addition. The total annual operating cost is $162,628 for all utilities which represents about $0.935 per sq. ft.

The structure appears to be in very good condition and well maintained. Electronic ballast with 32 watt T-8 fluorescent lamps has been installed in the entire facility except for the boiler room. If the ballast is an instant start, the lamps can be upgraded to 28 watts to save even more energy.

The boiler room appears very clean for a coal fired plant. The controls are pneumatic and all the gauges appear to be functioning properly. Window air conditioners were in all windows where they were needed.

Recommended Improvements:

- All single pane windows should be replaced with a good quality thermo-pane without the reflectance, because most of your degree days are heating.
- Update water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest water closet on the drain line to help flush the pipe with a little extra water.
- Update urinals to low consumption.
- Emergency and LED exit lights should be put on the emergency generator. This will eliminate the labor and battery costs.
- Upgrade the gymnasium lighting to High Bay T-5 florescent lights. A photometric study should be done to insure that the lighting foot candles are achieved. (Minimum 50fc)
- Update systems to add air conditioning. Variable Volume units are more efficient and work the best with parallel fan powered boxes or straight variable volume boxes. Series boxes are expensive energy wise, and when the fan operates all the time it has higher maintenance costs. The units should have variable frequency drives and premium efficiency motors to complete the energy savings package.

Fort Hill High School

Fort Hill High School has approximately 190,000 square feet in a building originally constructed in 1936 with addition in 1980, 1992 and 1998. The facility, with the exception of the 1980 addition, had a major renovation in 1992. In 1992, ADA access was provided, throughout the building and site. The 18 acre site has grounds in very good condition.

The building is in very good condition after the recent renovation. The gymnasiums, auditorium and cafeteria roofs are in good condition; however, the roofing for academic portion of building is in poor condition and has extended beyond warranty by a few years.

ELECTRICAL SYSTEMS

Description of Systems

Electric service to the building is 480 volts, 3-phase, and terminates two separate pieces of switchgear. One piece of switchgear is 3000 amp with one (1) main disconnect device and several distribution breakers. The majority of the school building is fed from this switchboard. The second main piece of electric gear is a switchboard with one (1) 800 amp main disconnect device and several distribution breakers. This switchboard feeds the gymnasiums and locker room areas of the school. These pieces of switchgear are located adjacent to one another in the same room. This electrical room has a limited number of NEC concerns as presently installed. Panelboards throughout the school are both flush and surface mounted and are mostly located in mechanical, electrical, and utility areas.

The building received a total electrical distribution system renovation in 1992. Therefore, the electrical distribution gear throughout the school is in good condition and appears to have adequate capacity. Additional electrical panels and circuits dedicated for classroom computers were added as part of the *Technology in Maryland Schools* project in 1999. Most electrical distribution gear in the facility is by Square-D and General Electric Company. An emergency generation system exists and is comprised of a 40KW diesel generator and automatic transfer switch. This generator provides power to life safety systems in the event of a power outage from the electric utility.

Lighting throughout the building is comprised mainly of fluorescent fixtures using T8 fluorescent lamps and high bay type fixtures using high intensity discharge metal halide lamps. A limited number of fixtures in the building are using T12 fluorescent

lamps. Lighting throughout the school was replaced as a part of the 1992 renovation and is in good condition overall.

- Lighting in classroom, office, and kitchen spaces consists of recess mounted fluorescent fixtures with acrylic diffusers. Lighting levels in these spaces is adequate.
- The cafeteria contains recess mounted 2'x2' fluorescent fixtures with acrylic diffusers. These fixtures are in good condition and provide adequate levels of illumination. Corridor lighting consists of a combination of linear-type recess mounted parabolic fluorescent fixtures, recess mounted 12"x12" fixtures with compact fluorescent lamps, surface mounted fluorescent fixtures with acrylic diffusers, and 2'x2' recess mounted fixtures with fluorescent lamps. For the most part, corridor lighting levels are adequate. Locker room and utility areas contain surface mounted fluorescent fixtures with acrylic diffusers.
- Lighting in the library and a portion of the computer labs consists of 2'x4' recess mounted parabolic fluorescent fixtures.
- The gymnasium contains high-bay type fixtures with metal halide lamps. These fixtures provide adequate lighting levels in this space.
- The auditorium and stage area contains recess mounted incandescent fixtures, pendant mounted incandescent fixtures, and stage lighting fixtures, all of which appear to have been replaced during the previous renovation to the auditorium area. Lighting in the auditorium wing of the building is in good condition and provides appropriate lighting for the type and use of the associated spaces.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school. However, some spaces do have alternate row type switching arrangements. No automatic lighting controls are present.

Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting in the gymnasium area of the building. Emergency lighting throughout the remainder of the facility is provided via the aforementioned emergency generation system. Exit signs consist of both incandescent type as well as LED type. A portion of the exit signs throughout the building, namely the incandescent type, are not working. Exterior lighting is provided by pole mounted luminaries with high intensity discharge lamps. In the event of a power outage, exterior emergency egress lighting is not present.

Receptacles located throughout the building are 120V-20A. Receptacles throughout the building were replaced as a part of the 1992 renovation and are in good condition.

Additional receptacle devices were also added via surface raceway as part of the *Technology in Maryland Schools* project in 1999. Receptacle locations and quantities appear to be adequate for school and office type use.

Deficiencies Noted

The main electrical gear room has a limited number of NEC discrepancies.

- The greenhouse has non-weatherproof type fixtures with exposed lamps in a wet area.
- Emergency egress lighting in the gymnasium area of the building is not adequately spaced in many locations, not providing the required egress illumination in the case of a loss of power. Also, several exit signs are either not working or their illumination levels are not adequate.
- There is not any exterior emergency egress lighting.

Recommended Improvements

- Correct the above noted NEC violations that exist with the electrical gear and installation thereof.
- Replace all fixtures utilizing T12 lamp and magnetic ballast technology with similar type fixtures utilizing T5 or T8 lamps with electronic ballasts.
- Add fluorescent type building mounted light fixtures that would be controlled via a direct digital control system. Connect these fixtures to the emergency generation system.
- Replace incandescent exit signs throughout the building. Replace and supplement, where needed, existing emergency egress lighting with additional wall mounted battery pack fixtures. As an alternative, fluorescent fixtures connected to the emergency generation system could be added in these areas.
- Install occupancy sensors throughout the school for control and energy efficiency.

HVAC SYSTEMS

Description of Systems

Building heat is provided from three steam boilers – two are coal fired and the third is gas-fired. The gymnasiums are served by steam. The reminder of the building is heated by hot water generated from a steam-to water heat exchanger using steam from the boilers. Hot water is distributed to coils throughout the building (less gymnasiums) by three base mounted pumps. There is no central cooling source.

- In general, the classrooms are heated by heating-only unit ventilators located below windows on exterior walls. Cooling is typically not provided to

classrooms except where residential type window air conditioning units have been installed.

- The kitchen is served by a single heating and ventilating (H&V) unit with hot water heating coil.
- The cafeteria is served by multiple heating-only unit ventilators with hot water coils.
- The original gymnasium is served by two indoor H&V units located within chases in two corners of the gymnasium. These units are equipped with steam heating coils.
- The newer gymnasium is served by two rooftop H&V units with steam heating coils.
- The music and band wing is served by multiple split system air conditioning units with hot water heating coils.
- The media center, science prep rooms and computer rooms are served split system air conditioning units with hot water heating coils.
- The auditorium is served by four indoor H&V units located in all four corners of the auditorium/stage. These units are equipped with hot water coils.
- The administrative and guidance areas are served by split system air conditioning units with hot water heating coils.
- The shop area is provided a dust collection system and make-up air unit with hot water heating coil.

Aside from the gymnasium areas and the two coal-fired boilers, most of the HVAC equipment was installed during the 1992 renovation. The coal-fired boilers appear to be original to the building, while the gas fired boiler appears to be approximately 30 years old. It was reportedly installed used during the 1992 renovations. HVAC controls are pneumatic.

Deficiencies Noted

The kitchen hood is not equipped with a fire suppression system. The school system has been granted a waiver to the requirements of NFPA 96 § 10.1.2 which requires fire suppression system for equipment that uses grease laden vapors. The school does not use such equipment.

Indications are that the age of most of the major equipment is approximately 15 years, with the equipment in the gymnasiums older. The condition of the equipment appears to be fair. The coal fired boilers appear to be in excess of 60-70 years old, while the age of the gas fired boiler appears to be approximately 30 years. It appears as though the boilers have been well maintained. ASHRAE estimates that the statistical service life for

equipment of this type would be in the range of 25-35 years and pneumatic controls approximately 20 years.

Recommended Improvements

- A complete HVAC renovation of the facility will likely be required within the next 10-15 years. At that time, the existing systems should be removed and replaced with new systems. The most appropriate system would be evaluated and considered based on variables (such as energy costs) at that time.

PLUMBING SYSTEMS

Description of Systems

The visible sanitary waste and vent system is a combination of cast iron and PVC pipe and appears to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping. The waste piping from the two and three compartment sinks in the kitchen is PVC.

The exposed science laboratory waste piping is acid resistant flame retardant polypropylene. It is unknown if the waste from the laboratories passes through a neutralization device prior to discharging into the public sanitary sewer system.

The roof drainage system for the building is composed of roof drains with interior water conductors that extend below the floor. The roof drainage system appears to be working satisfactorily but the condition of the piping is unknown.

The gas service enters the building at the (plan) east side the Boiler Room and serves the gas fired boiler, two gas fired water heaters, cooking equipment in the kitchen and science laboratory outlets. The gas piping system is constructed of black steel and is in working condition. The gas service in the boiler room appears to be approximately 8"; sized for future replacement of the two existing coal fired boilers with gas fired boilers. A 6" cast iron cold water service transitioning to 4"copper enters into the Boiler Room. A 4" water meter is provided on the cold water service at the point of entry into the building. The domestic water systems consist of cold water, hot water and hot water circulating piping constructed of copper. The hot water circulating pumps are cast iron. The domestic hot water for the building is being generated by an external steam to water heat exchanger and two gas fired water heaters connected to a hot water storage tank located in the boiler room. The gas fired water heaters are used when the boilers are not in operation. The water heater housings indicate they were manufactured at different times. It is unknown if the water heaters were installed at the time of building renovations in 1992 or if they are replacement units. The hot water storage tank appears

to pre date the building renovation. There is considerable rust on the plate on the end of the tank. The hot water storage tank is insulated but repairs have been made to the insulation. The material or condition of the storage tank lining is unknown. The domestic water systems appear to be in working condition.

The vocational shops are equipped with compressed air. Shop welding gasses are supplied from portable tanks.

The plumbing fixtures consist of vitreous china wall mounted flush valve water closets; vitreous china wall mounted flush valve urinals; a combination of cast iron wall hung, vitreous china wall hung, and vitreous china countertop mounted lavatories and countertop sinks. Plumbing fixtures appear to be as installed at the time of building renovations and are in good condition. The water closets and urinals do not appear to comply with present water consumption requirements. Hot water is available to all lavatories tested. The toilets throughout the facility are handicapped accessible but covers are not provided on the accessible lavatory traps and water supplies. Wall mounted showers are located in the boys' and girls' locker rooms. The showers in the girls' locker room are not used, and the space appears to be used for storage. The water coolers are handicapped accessible, in good condition and operate properly. Mop sinks are built in the floor.

Deficiencies Noted

The water service is not equipped with a backflow preventer.

Covers are not provided on the handicapped accessible lavatory trap and water supplies to prevent burning of users legs.

Water closets and urinals do not comply with present water consumption requirements.

Recommended Improvements

- Provide covers on the handicapped accessible lavatory water supplies and trap.

FIRE PROTECTION SYSTEMS

Description of Systems

A 6" fire service enters the building in a space located below the gymnasium. A 34 horsepower vertical fire pump with limited service controller and alarm is located in the space. A combination standpipe/wet sprinkler system is provided throughout the facility with 2 1/2"hose valves located at each floor in the exit stairways. Standpipes are not provided for the stage.

Deficiencies Noted

No deficiencies noted.

TECHNOLOGY INFRASTRUCTURE

Description of Infrastructure

Fort Hill High School is supported by a wireless network (microwave ring) supplied by Allegany County Public Schools. Internally, the school uses 10 gigabit single mode fiber optic cable between the MDF and the IDFs. The horizontal cable from the MDF or IDFs to the workstation locations is category 5 (Systimax) data cable. Voice horizontal cable is generally category 3 cable, and the voice system is an analog/digital telephone switch. Equipment racks are generally 2-post, 7' equipment racks; however, the school is converting to 4-post racks in the MDF to support server equipment as well as standard network components. The servers and other mission-critical equipment are being supported by APC 3000 watt uninterruptible power supplies.

The school uses streaming video to the classrooms over the existing network from a Safari video distribution server. Fort Hill High School also has a Blonder-Tongue video distribution cabinet for coax distribution of CATV to the classrooms; however, the system is not being used. Most classrooms have approximately 4 data drops in them with the exception of the labs. The high school has a total of eight (8) remote closets or cabinets. The school has wireless access points (WAPs) installed which provide adequate coverage for the public areas. They also have mobile computing carts with an additional WAP and 15 or more laptop PCs on each cart. Carts are on each level for teacher's use. The WAPs are secured with both WPA and WEP security systems and access is controlled from a centralized MAC address authentication data base. All WAPs are set up as "G" radios (54 mbps).

Deficiencies noted:

The school has fiber installed to the IDFs; however, not all closets are using the fiber but are connected by copper links to the MDF. These links are very restricted in speed and are prone to interference from outside sources. One cabinet that is the greatest distance from the MDF is copper connected although fiber is available. Equipment racks are not grounded.

VoIP has not been implemented in this school because the phone switch is fairly new. There are numerous core drills for cable paths that do not have sleeves installed in them and are not firestopped.

Recommended improvements:

- Ground all racks to a unified building ground to prevent differences in potential and to protect personnel.
- All core drills should have sleeves with insulated bushings installed in them prior to having cables installed. All vertical pathways (core drills) need to be firestopped as a life safety issue.

ENERGY

Description of Energy

Fort Hill High School was originally built in 1935 and remodeled in 1991-1992. Annual utility costs are $175,194 which represents about $.91 per sq. ft.

The structure appears to be in very good condition and well maintained. Thermo-paned windows were installed in the 1991-1992 remodels and the T-8 lighting upgrade was completed at a later date. These two items contribute to the high energy savings. The maintenance staff appears to be doing a fine job keeping the facility looking great.

The boiler room appears very clean for a coal plant. One boiler will take the building down to 25 f and a second boiler is added. The number one boiler is a natural gas unit that was installed 1979. The operator mentioned that they would like the steam unit that is down by the gym changed from steam to hot water for more efficient operation. Time clocks set at 7:30 am and 4:30 pm control most of the equipment using pneumatic controls and appears to be doing an adequate job of controlling the facility.

Recommended Improvements:

- Upgrade the gymnasium lighting to High Bay T-5 florescent lights. A photometric study should be done to insure that the lighting foot candles are achieved. (Minimum of 5 ofc)
- Upgrade the work lights behind the curtain on the stage to florescent fixtures for more constant working light.
- Update the water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest toilet on the drain line to help flush the pipe with a little extra water.
- Update the urinals to low consumption.
- Emergency and LED exit signs should be placed on the emergency generator. This will eliminate all the labor and battery replacement costs.
- Update systems to add air conditioning. Variable volume units are more efficient and work the best with parallel fan powered or straight variable volume boxes. Series boxes are more expensive energy wise and when the fan operates all the time it has a higher maintenance cost. The units should have variable frequency drives and premium efficiency motors to complete the energy savings package.

Center for Career and Technical Education

The Center for Career and Technical Education (CCTE) has approximately 141,000 total square feet. The Skills Building was constructed in 1970. A portion of the building was demolished and rebuilt in 1994. Total square footage is 116,000. The Academic Building is 25,000 square feet and was built in 1974 with an addition in 2004. The facility has a theater/classrooms and offices.

The Skills Building had parking improvements in 2001. The 2004 addition to the Academic Building included an elevator, lobby area, and exterior ADA ramps. There are some locations with erosion problems and temporary storage buildings should be replaced.

In the original building, doors and hardware are not ADA compliant however ramps and elevators were provided in 2004 improvements. The roofing appears in good condition but should be considered for replacement in three to five (3-5) years. Windows are original and do not have insulated panes. Doors throughout show age and many need upgrade and ADA hardware.

Concrete frame and brick are in good condition. Some restrooms have been modified to accommodate disabled but they are not fully accessible.

The 1994 addition to the Skills Building is fully ADA compliant and in good condition. The roofing appears in good condition but should be considered for replacement in three to five (3-5) years.

The Academic Building does not fully meet ADA standards. The roofing appears in good condition. Exterior painting is needed.

ELECTRICAL SYSTEMS

Description of Systems

Skills Training Building:

Electric service to the building is 480 volts, 3-phase, and terminates a 4000 amp switchboard. The switchboard contains multiple fused switches which distribute power to branch circuit panelboards throughout the facility. A disconnect switch has also been tapped from the buswork of the switchboard. The current switchboard and installation thereof is not compliant with the NEC. General purpose panelboards are predominately located in the corridors and panelboards that serve shop areas are located within the areas being served. Some electrical gear has been added since the original building construction, namely the renovation and addition work performed in

the 1990's and in 2004. Additional electrical panels and circuits dedicated for classroom computers were added as part of the *Technology in Maryland Schools* project in 2003. This gear is in good condition. However, electric gear that remains original to the building, while operational, is outdated and has reached the end of its useful life. Any modifications or alterations made would require replacement of the gear. There are a small number of NEC discrepancies that exist with the electrical gear installed as part of the 1990's renovation and addition work. An emergency generation system is not present at this facility.

Lighting throughout the building is comprised of many different fluorescent light fixtures, including pendant mounted industrial style in shop areas, surface mounted fixtures with acrylic lenses and recess strip type fixtures in corridors, pendant mounted fixtures with acrylic diffusers, surface mounted strip type fixtures, recess mounted lensed fixtures and industrial style surface mounted fixtures in classrooms, recess mounted parabolic fixtures in the conference room, and surface mounted fixtures with drop opal lenses in the cafeteria and kitchen. In most cases, where fixtures remain original to the building or where they were not replaced as part of the renovation and addition work done in the 1990's or in 2004, the fixtures have reached the end of their useful lives. Lighting levels in these areas, namely the shop areas, is marginal at best for task-oriented type activities. The majority of lighting in the school was updated through a retrofit program sponsored by the electrical power company in 1990.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school. However, some spaces do have alternate row type switching arrangements. No automatic lighting controls are present.

Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting throughout the building. Also, in the 1990's addition area, a portion of the fixtures contain battery ballasts devices. Most exit signs throughout the building are LED type. A portion of these devices are not working. Building mounted lighting consists of wall mounted fixtures with high intensity discharge lamps and canopy mounted, surface type cylindrical fixtures.

Receptacles located throughout the building are 120V-20A. Many receptacles are original to the building construction. Additional receptacle devices have been added in various locations throughout the school as part of the *Technology in Maryland Schools* project in 2003. However, in general, receptacles are not adequately spaced for school and shop type use. Certain shop areas contain bus duct with unit mounted breakers

and disconnect switches. Some of the bus duct is not currently being used. The remainder of the bus duct is feeding shop equipment via flexible connections.

Academic Building:
Electric service to the building is 208 volts, 3-phase, and terminates a 1200 amp switchboard. The switchboard contains multiple breakers which distribute power to branch circuit panelboards throughout the facility. This main gear is in fair condition, but has limited spare capacity. Branch circuit panelboards located throughout the building are in fair condition, but have a portion of associated NEC deficiencies. Additional electrical panels and circuits dedicated for classroom computers were added as part of the *Technology in Maryland Schools Project* in 2003. In general, electrical distribution gear is in fair condition, but offers little room for spare capacity. An emergency generation system is not present at this facility.

Lighting throughout the building is comprised predominately of fluorescent fixtures.

- Corridor lighting consists of recessed fluorescent and wall mounted fluorescent fixtures. Classroom and library lighting consists of recess mounted 2'x4' fluorescent fixtures with acrylic diffusers.
- Industrial style fluorescent light fixtures are utilized in mechanical type spaces. Most of these above fixtures utilize T8 lamps.
- The auditorium contains recess, pendant, and stem mounted incandescent fixtures. These fixtures are all switched, with no dimming system present.

In general lighting levels throughout are adequate for the use of each associated space. The condition of lights throughout is fair, with replacement more than likely being needed within the next 10 years.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school; however, some spaces do have alternate row type switching arrangements. No automatic lighting controls are present.

Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting throughout the building. Most exit signs throughout the building are LED type; however, the exit signs located in the auditorium space are incandescent type and have reached the end of their useful life. A portion of these devices are not working.

Receptacles located throughout the building are 120V-20A. Many receptacles are original to the building construction. Additional receptacle devices have been added in

various locations throughout the school as part of the *Technology in Maryland Schools* project in 2003. In some cases, receptacles are not adequately spaced for school type use.

Deficiencies Noted

Skills Training Building:

The main electrical gear room has a number of NEC discrepancies.

A limited number of panelboards have NEC discrepancies and clearance issues in some locations.

Emergency egress lighting in the original building area is not adequately spaced in many locations, not providing the required egress illumination in the case of a loss of power. Also, several exit signs are either not working or their illumination levels are not adequate.

Several of the shops, such as carpentry, do not have sealed type fixtures. Lighting levels in many shop areas and in the kitchen are not adequate for the type work being performed.

In some cases, surface mounted receptacles have outlet boxes with missing knock-out covers, allowing wiring to be exposed to occupants. This is in violation of the NEC.

Academic Building:

Several exit signs are not working and emergency egress lighting may not be adequate in some locations.

A limited number of panelboards have NEC discrepancies and clearance issues in some locations.

Recommended Improvements

Skills Training Building:

- Correct the NEC violations previously noted.
- Replace all lighting throughout the school which is original to the building's construction. Areas that do not have original lighting will have lighting the lighting replaced where illumination levels are not adequate for the space being served. Install occupancy sensors and photocells throughout the school for control and energy efficiency. Lighting that was installed during the 1994 renovation and addition could remain in-use.

- Add fluorescent type building mounted light fixtures that would be controlled via a direct digital control system.
- Replace incandescent exit signs throughout the building. Replace and supplement, where needed, existing emergency egress lighting with additional wall mounted battery pack fixtures.

Academic Building:

- Correct the above noted NEC violations that exist with the electrical gear and installation thereof.
- Provide a basic dimming system for the auditorium space, replacing a portion of the fixtures with dimmable fluorescent fixtures of the same type.
- Assess the lighting and power systems on a space-by-space basis, replacing and/or supplementing as required.
- Add fluorescent type building mounted light fixtures that would be controlled via a direct digital control system.
- Replace incandescent exit signs. Replace and supplement, where needed, existing emergency egress lighting with additional wall mounted battery pack fixtures.
- Install occupancy sensors throughout the school for control and energy efficiency.

HVAC SYSTEMS

Description of Systems

Skills Training Building:

The building is served by three dual fuel (gas & oil), hot water boilers. Hot water is distributed throughout the building by two base mounted pumps. A glycol solution is utilized for freeze protection.

- The auto technology, industrial manufacturing, auto body, and welding labs are served by heating and ventilating (H&V) units with hot water heating coils. The auto body lab has two paint booths – the newer appears to be provided with make-up air while the older booth appears to draw make-up air from the space. The welding lab is provided with individual welding booths with exhaust manifolded into two separate exhaust systems.
- Five (5) indoor air handling units are located in mechanical spaces to serve the kitchen, cafeteria, cosmetology lab, health occupations, and the computer/IT area. It has been reported that they were originally installed with evaporative cooling capability. However, the cooling tower has been removed and they now serve as H&V units with hot water coils only. Several of these spaces have been provided with residential type window air conditioning units for cooling.
- Small residential split system air conditioning units serve the administrative and lobby areas as well as the art area and associated ancillary spaces.

- Classrooms in the "C" Wing are each served by small residential type split system air conditioning units consisting of indoor air handler and condensing unit located on the roof.
- The construction labs in the "C" Wing (Masonry, HVAC, Electrical, and Carpentry) are served by H&V units with hot water heating coils.
- The existing fashion careers lab was being renovated and converted to the culinary arts lab at the time of the field investigation.

The boilers are approximately six years old and are in good condition. The remainder of major equipment (excluding "C" Wing) appears to be original to the building, approximately 40 years old. The condition of this equipment ranges from fair to poor. The systems in the "C" Wing appear to be approximately 15 years old and are in fair condition.

Academic Building:
The building is served by two gas-fired hot water boilers. Hot water is distributed throughout the building by two base mounted pumps.

Cooling is provided by a split system, air cooled chiller. Chilled water is distributed to cooling coils by a base mounted chilled water pump.

The building is heating and cooling by three indoor multi-zone air handling units with hot water heating coils and chilled water cooling coils. A single unit serves the auditorium and the remaining two units serve both floors of the classroom wings.

The chiller and boilers are approximately six years old. The multi-zone units appear to be original construction.

Deficiencies Noted
Skills Training Building:
On the day of the team's field investigation, print odors emanating from the print shop were evident throughout the lower level of the "C" Wing. Indications are that the age of most of the airside equipment is approximately 15 years in the "C" Wing and 40 years in the remainder of the building. The "C" wing equipment is in fair condition. The remainder of this equipment is in fair to poor condition.

ASHRAE estimates that the statistical service life for the airside equipment of this type would be in the range of 15-20 years (15 years for the residential split systems and 20 for

the units with water coils alone). Statistical anticipated service life for the boilers is approximately 30-35 years and approximately 20 years for pneumatic controls.

Academic Building:
There are indications that the dampers providing multi-zone control in the air handling units are not operating properly. Return air from individual spaces is transferred into the corridor and returned to the units through return grilles located in the corridor. This effectively utilizes the corridor as a return plenum. The practice of using the corridor as a return plenum is no longer allowed by code.

Indications are that the age of most of the airside equipment is approximately 30 years. ASHRAE estimates that the statistical service life for the airside equipment of this type would be in the range of 15-20 years. This equipment is in fair condition although the dampers controlling the hot and cold deck airflow to the zones appear to be in poor condition. Expected service life for the boilers would be approximately 30-35 years and approximately 20-25 for the chiller.

Recommended Improvements

Skills Training Building:

- A complete HVAC renovation of the facility is warranted. With the exception of the boilers, the existing systems should be removed and replaced with new systems. Many factors would influence the type of system that might best serve the school. Based on information available at this time, it might be expected that a four pipe VAV system would be recommended. Classrooms would be served by central, variable air volume (VAV) systems consisting of air handling units with chilled water cooling coils and hot water heating coils to provide supply air to VAV boxes located in the spaces to allow for individual temperature control of the space or zone served. Shop type areas would each be served by a single zone blower coil units or make-up air units. Energy recovery could be provided where practical. Ventilation air would be introduced at the air handling units. Heat would be supplied by the existing boilers and heating water would be pumped to coils located throughout the building as well as areas requiring baseboard heat. Central cooling would be provided by an air or water cooled chiller and chilled water would be pumped to coils located throughout the building. The systems would be controlled by the latest generation direct digital control system to provide safe, automated control of all systems and management of energy conservation functions.

Academic Building:

- A complete HVAC renovation of the facility is warranted. With the exception of the boilers and chiller, the existing systems should be removed and replaced with new systems. Many factors would influence the type of system that might best serve the school. Based on information available at this time, it might be expected that a four pipe VAV system would be recommended. Classroom wings and auditorium would be provided with central, variable air volume (VAV) systems consisting of air handling units with chilled water cooling coils and hot water heating coils to provide supply air to VAV boxes located in the spaces to allow for individual temperature control of the space or zone served. The auditorium would incorporate demand control ventilation. Ventilation air would be introduced at the air handling units. Heat would be supplied by existing boilers and heating water would be pumped to coils located throughout the building as well as areas requiring baseboard heat. Central cooling would be provided by the existing air cooled chiller, and chilled water would be pumped to coils located throughout the building. The systems would be controlled by the latest generation direct digital control system to provide safe, automated control of all systems and management of energy conservation functions.

PLUMBING SYSTEMS

Description of Systems

Skills Training Building:

The visible sanitary waste and vent system is a combination of cast iron sanitary waste and vent, copper vent, galvanized steel vent, PVC piping where renovations have been made and appears to be working satisfactorily, but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The roof drainage system for the building is composed of roof drains with interior water conductors that extend below the floor. Exposed piping is cast iron or steel. The roof drainage system appears to be working satisfactorily but the condition of the piping is unknown.

An 8" gas service enters the building in the boiler room and serves the boilers two gas fired water heaters located in the boiler room and gas fired cooking equipment in the kitchen. The gas piping system is constructed of black steel and is in working condition. The gas meter is located outside the building adjacent the computer lab and is enclosed inside a chain link fence.

Compressed air is provided to all shops from air two compressors located in the boiler room. In addition, there are tank mounted air compressors located on the auto technology mezzanine, carpentry room and electrical maintenance lab. Compressed air piping is black steel appears to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping. Welding gasses are supplied by portable tanks.

The 4" cold water service serving the building enters into auto technology area with the service valve, 4" pressure reducing valve, and bypass located on the mezzanine. The domestic water systems are constructed of copper and consist of cold water, hot water, and hot water circulating piping. The domestic hot water for the building is being generated by two gas fired storage water heaters connected to an insulated vertical hot water storage tank located in the boiler room. A tempering valve is provided on the hot water piping serving the building. Hot water circulating pumps are bronze construction. The domestic water systems appear to be working satisfactorily, but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The plumbing fixtures consist of a combination of vitreous china wall and floor mounted flush valve water closets; vitreous china wall mounted flush valve urinals; a combination of vitreous china and cast iron wall mounted lavatories; eyewash stations, wall mounted water coolers and a combination of three station cast iron sinks and lavatories are provided in all shops; wall mounted water coolers and stainless steel sinks. Floor mounted water closets do not comply with present water consumption requirements. Handicapped accessible toilet fixtures are provided, but the lavatory traps and supplies do not have covers to prevent burning of the users legs. Hot water is supplied to all lavatories and sinks. The fixtures are generally in good condition and fixtures tested operate properly; however, some fixtures in the shops are dirty.

Deficiencies Noted

The water service is not equipped with a backflow preventer.

Floor mounted water closets do not comply with present water consumption requirements.

Handicapped accessible lavatory traps and supplies do not have covers to prevent burning of the users legs.

Recommended Improvements

- Provide covers on the handicapped accessible water supplies and trap.

FIRE PROTECTION SYSTEM

Description of Systems

Skills Training Building:

The 6" fire service enters the building in the auto technology shop. The fire service is not equipped with a backflow preventer**.** A partial sprinkler system is provided in the building with heads located in all shops and the reconstructed portion of the building. Sprinkler piping is steel and is in working condition. There is no indication of repairs to the sprinkler system but the condition of the piping is unknown.

Deficiencies Noted

No deficiencies noted

PLUMBING SYSTEMS

Description of Systems

Academic Building:

No visible piping was observed of the sanitary waste and vent system. School maintenance personnel report the system is cast iron and is operating satisfactorily with no problems.

The roof drainage system for the building is composed of roof drains with interior water conductors that extend below the floor. The visible piping located between the small and large auditoriums is insulated, but an exposed union indicates the rain conductor from the roof drain is steel. It is unknown if all interior rain conductors are steel. School maintenance personnel report the system is operating satisfactorily with no problems.

The gas meter for the annex is located at the Bus Repair Facility nearby. The 6" gas service enters the building in the boiler room and serves the boilers, a gas fired water heater located in a space between the small and large auditoriums and the science labs. Master gas cutoff valves are provided at the entrance into the science lab space. The gas piping system is constructed of black steel and is in working condition.

The 3" cold water service with pressure reducing valve serving the building enters in the boiler room. The domestic hot and cold water systems are constructed of copper. Domestic hot water for the building is being generated by a gas fired storage water

heater located in a space between the small and large auditoriums. School maintenance personnel report the domestic water system is operating satisfactorily with no problems.

The plumbing fixtures consist of vitreous china floor mounted flush valve water closets; vitreous china wall mounted flush valve urinals; vitreous china wall mounted lavatories; wall mounted water coolers and stainless steel sinks in the science labs. Water closets do not comply with present water consumption requirements. Handicapped accessible water closets are provided. Handicapped accessible urinals and lavatories are not provided. Hot water is supplied to all lavatories. The fixtures are in good condition and operate properly.

Deficiencies Noted

The water service is not equipped with a backflow preventer.

Water closets do not comply with present water consumption requirements.

Handicapped accessible urinals and lavatories are not provided.

FIRE PROTECTION SYSTEM

Description of Systems

Academic Building:

The building is equipped with limited area sprinkler systems in the boiler room and the space between the small and large auditoriums. The 3" sprinkler service is connected to the 3" domestic water service at the point of entry into the building. The fire protection system supply has an OS&Y gate valve locked in the open position with a chain; check valve and flow switch at the point of connection to the cold water service.

Deficiencies Noted

No deficiencies noted

TECHNOLOGY INFRASTRUCTURE

Description of Infrastructure

The Career Center is supported by a wireless network (microwave ring) supplied by Allegany County Public Schools. Internally, the school uses 10 gigabit counter rotating rings of single mode fiber optic cable between the MDF and the IDFs. The horizontal cable from the MDF or IDFs to the workstation locations is category 5E (Systimax) data cable. Voice horizontal cable is generally category 5E Systimax cable as well and the

voice system is Voice over IP (VoIP). Analog cards within the VoIP system provide the analog requirements within the building. Equipment racks are generally 2-post, 7' equipment racks; however, the school is converting to 4-post racks in the MDF to support server equipment as well as standard network components. The servers and other mission critical equipment are being supported by APC 3000 watt uninterruptible power supplies.

The school uses streaming video to the classrooms over the existing network from a Safari video distribution server. There is a Blonder-Tongue video distribution cabinet in the MDF for coax distribution of CATV and internal broadcasts. A separate Bogan PA system is also installed in the MDF. Most classrooms have approximately four data drops in them, as well as a coax drop, and some classrooms have projectors installed. The school has wireless access points (WAPs) installed which provide adequate coverage for the public areas. They also have mobile computing carts with an additional WAP and 15 or more laptop PCs on each cart for teacher's use. The WAPs are secured with both WPA and WEP security systems and access is controlled from a centralized MAC address authentication data base. All WAPs are set up as "G" radios (54 mbps).

Deficiencies Noted:
Servers are sitting on the floor in the MDF.

Recommended Improvements:
- POE switches and VoIP equipment should be supported by UPS power to prevent the phone system from becoming inoperable during power outages.
- Install servers in a 4-post rack to prevent damage to the equipment and improve accessibility within the MDF.

ENERGY
Description of Energy
The campus is comprised of two facilities. Annual operating expenses are $166,316 or about $1.18 per sq. ft.

The structure appears to be in very good condition and well maintained. Sections A, B, and C have been upgraded with T-8 lighting. The Annex however still has some T-12 fixtures that will need to be upgraded. The boilers are duel fuel (natural gas or fuel oil) and were upgraded in the 2003-2004 plant renovation. Time clocks and pneumatic controls appear to be doing an adequate temperate control of the facility.

Recommended Improvements:

- All single pane windows should be replaced with a good quality thermo-pane without the reflectance because most of your degree days are heating.
- Update water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest water closet on the drain line to help flush the pipe with a little extra water.
- Update urinals to low consumption.
- Emergency and LED exit lights should be put on the emergency generator. This will eliminate the labor and battery costs.
- The Annex should have the lighting upgraded to T-8's.
- Update systems to add air conditioning. Variable volume units are more efficient and work the best with parallel fan powered boxes or straight variable volume boxes. Series boxes are expensive energy wise, and when the fan operates all the time it has higher maintenance costs. The units should have variable frequency drives and premium efficiency motors to complete the energy savings package.

Braddock Middle School

Braddock Middle School has approximately 99,000 square feet built in 1965 with no major renovations or additions.

The 25 acre site is a very adequate size. Asphalt repair is needed. There is no ADA accessibility around the site or to the building.

The roofing, installed in 1989, is in poor condition and should be replaced in the next few years. Windows are original and do not have insulated panes. Exit doors do not meet current accessibility codes.

Many of the floors are asbestos tiles and should be replaced. Doors and hardware are not ADA compliant and many areas of the building are not directly accessible. Notably the girl's locker room is upstairs from the gymnasium.

The restrooms are serviceable, but are in need of modernization. Some restrooms have been modified to accommodate disabled, but they are not fully accessible.

ELECTRICAL SYSTEMS

Description of Systems

Electric service to the building is 208 volts, 3-phase, and terminates in a 3000 amp main switchboard with one (1) main disconnect device and several distribution breakers. This switchboard feeds multiple panelboards throughout the facility. Panelboards throughout the school are flush mounted and located in corridors, kitchens and utility areas. Additional electrical panels and circuits dedicated for classroom computers were added as part of the *Technology in Maryland Schools* project in 2003. However, the majority of the electrical distribution equipment is original to the building. This original gear is in working condition, but has limited spare capacity and, due to its age, replacement and new breakers may not be readily available. Most electrical distribution gear in the facility is by Square-D. An emergency generation system is not present at this facility.

Lighting throughout the school is comprised of many different fluorescent type fixtures and fixtures with high intensity discharge lamps. Fluorescent lamps being used consist of T8, T12, and compact fluorescent types. The majority of lighting in the school was updated through a retrofit program sponsored by the electrical company in 1990. Most original lighting fixtures that contained incandescent lamps at one time have been retrofitted with fluorescent lamps. Other lighting throughout the school has been

replaced, such as in the kitchen, cafeteria, and corridors. This lighting is in good condition and is providing adequate levels of illumination where located.

- Lighting in classroom spaces consists of pendant mounted fluorescent fixtures with acrylic diffusers. Lighting levels in classroom spaces are marginal.
- The cafeteria and most corridors throughout the school contain recess mounted 2'x2' parabolic type fluorescent fixtures. These fixtures are in good condition and provide adequate levels of illumination in these spaces. Other corridor lighting consists of recess mounted fixtures, original to the building, that have been retrofitted with compact fluorescent lamps.
- Locker rooms, small offices and some utility areas contain surface mounted round fixtures with opal lenses. These fixtures are original to the building and have been retrofitted with compact fluorescent lamps.
- Lighting in administrative areas consists of pendant mounted fluorescent fixtures with acrylic lenses, surface mounted 2'x4' fluorescent fixtures, and recess mounted 2'x4' fixtures with acrylic lenses. These fixtures provide lighting levels that are marginal to adequate based on the particular space.
- Lighting in the library consists of 4'x4' fluorescent fixtures with drop opal lenses. These fixtures appear to be original to the building's construction.
- The gymnasium contains high-bay type fixtures with metal halide lamps. These fixtures provide marginal lighting levels in this space.
- The auditorium and stage area contains recess mounted incandescent fixtures, pendant mounted incandescent fixtures, and stage lighting fixtures, all of which appear to be original to the building's construction.
- Fixtures in other areas throughout the school, such as mechanical rooms, storage rooms, etc. contain a mixture of surface and pendant fixtures, most original to the building's construction.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school; however, some spaces do have alternate row type switching arrangements. No automatic lighting controls are present.

Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting. Exit signs consist of both incandescent type as well as LED type, both with battery back-up. Building mounted exterior lighting consists of wall-pack type fixtures with high intensity discharge lamps.

Receptacles located throughout the building are 120V-20A. Many receptacles are original to the building construction. Additional receptacle devices have been added as

part of the *Technology in Maryland Schools* project in 2003. Areas with higher densities of computers are utilizing power poles and plug strips to provide the required power for these spaces. Surface raceway has also been added to many classrooms

Deficiencies Noted

Due to the age of the original electrical distribution gear, its reliability and accuracy in providing overcurrent protection may be questionable.

There are many cases throughout the school where light fixtures have broken or missing diffusers, exposing bare lamps and wiring to occupants. This is in violation of the NEC.

In many locations throughout the school where original light fixtures remain installed, the lighting level in these areas is not adequate or marginal at best. Many of these fixtures, even though they contain fluorescent lamps, have lenses that have been discolored, which adversely affects the light output.

Emergency egress lighting throughout the building is not adequately spaced in many locations, not providing the required egress illumination in the case of a loss of power. Also, several exit signs are either not working or their illumination levels are not adequate.

In some cases, surface mounted receptacles have outlet boxes with missing knock-out covers, allowing wiring to be exposed to occupants. This is in violation of the NEC.

Recommended Improvements

- Replace the existing 208V, 3-phase electric service to the building with a 480V, 3-phase electric service. Also, replace the existing switchboard with a new switchboard and provide step down transformers and 208V distribution panelboards to feed existing electrical gear remaining. Existing branch circuit panelboards throughout the school would remain in-use. Test and replace as necessary the existing original electric gear that does not function (trip) properly.
- Perform a major lighting upgrade throughout the building. Install occupancy sensors and photocells throughout the school for control and energy efficiency. Lighting that has been installed within the recent past (5 years) could remain in-use.
- Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights.
- Replace building mounted light fixtures with fluorescent type wall pack fixtures that would be controlled via a direct digital control system.

- Replace exit signs throughout the building. Replace and supplement existing emergency egress lighting with additional wall mounted battery pack fixtures.
- Rectify all previously noted existing code violations.

HVAC SYSTEMS

Description of Systems

Building heat is provided by two coal-fired, hot water boilers. Hot water is distributed throughout the building by two base mounted pumps. There is no central cooling source.

- Classrooms and media center are heated by heating-only unit ventilators located below windows on exterior walls. Cooling is typically not provided to classrooms except for selected instances of residential type window air conditioning units.
- The upper level corridor is provided with multiple, high capacity exhaust fans to ventilate the building during summer months.
- The gymnasium is served by two heating and ventilating (H&V) units located in mechanical spaces off the boys' and girls' locker rooms. These units are equipped with hot water coils.
- The auditorium is served by two H&V units located above ceiling in the back of the auditorium. These units are equipped with hot water coils.
- The administrative area is served by hot water convectors and residential type window air conditioning units.
- The shop areas are heated with hot water unit heaters.

In general, aside from the window air conditioning units, most of the major HVAC equipment appears to be original construction. HVAC controls are pneumatic.

Deficiencies Noted

The condensing units for the kitchen refrigeration equipment are located within the corridor adjoining the kitchen. This location results in significant heat being dissipated into the space.

The kitchen hood is not equipped with a fire suppression system. The school system has been granted a waiver to the requirements of NFPA 96 § 10.1.2 which requires fire suppression system for equipment that uses grease laden vapors. The school does not use such equipment.

There are several instances where storage rooms serve as a return air plenums for air handling units. Two of these occur in the gymnasium where return air is drawn

through the lower level storage rooms to the air handling unit located above. The third instance occurs in the kitchen. The unit is located above ceiling in the dry food storage room and draws return air through the dry food storage room. This does not meet current code requirements.

Indications are that the age of the major equipment is approximately 40-45 years. The equipment condition appears to range between poor and fair. It appears as though the coal boilers have been well maintained. ASHRAE estimates that the statistical service life for equipment of this type would be in the range of 25-35 years and pneumatic controls approximately 20 years.

Recommended Improvements

- Storage rooms should not be allowed to serve as plenums (similar to those in the gym and kitchen). Should something begin to the burn in the storage room, smoke would be discharged into the space served by the HVAC unit. The returns for the kitchen and gymnasium units should be ducted to grilles located in the space.
- Condensing units for the kitchen refrigeration equipment should be relocated outdoors.
- A complete HVAC renovation of the facility is warranted. The existing systems should be removed and replaced with new systems. Many factors would influence the type of system that might best serve the school. Based on information available at this time, it might be expected that a four pipe VAV system would be recommended. Classroom wings would be provided with central, variable air volume (VAV) systems consisting of air handling units with chilled water cooling coils and hot water heating coils to provide supply air to VAV boxes located in the spaces to allow for individual temperature control of the space or zone served. The cafeteria, kitchen, gymnasium, and similar spaces would each be served by a single zone air handling unit incorporating demand control ventilation. Ventilation air would be introduced at the air handling units. Heat would be supplied by multiple boilers and heating water would be pumped to coils located throughout the building as well as areas requiring baseboard heat. Central cooling would be provided by an air or water cooled chiller and chilled water would be pumped to coils located throughout the building. The systems would be controlled by the latest generation direct digital control system to provide safe, automated control of all systems and management of energy conservation functions.

PLUMBING SYSTEMS

Description of Systems

The sanitary waste and vent system appears to be a combination of cast iron and copper and appears to be working satisfactorily but the condition of the piping is unknown. There is minimal pipe replacement from copper to PVC on some exposed lavatory waste piping. The waste piping from the two and three compartment sinks in the kitchen is PVC. A grease trap is located in the floor adjacent the three compartment sink.

The roof drainage system for the building is composed of roof drains with interior water conductors that extend below the floor. Exposed piping is predominately cast iron with some of the rain conductor piping in the connecting corridor replaced with PVC. The roof drainage system appears to be working satisfactorily, but the condition of the piping is unknown.

A 4" gas service enters the building in the boiler room and serves two gas fired water heaters located in the boiler room and gas fired cooking equipment in the kitchen. Gas piping to the science laboratories has been disconnected. The gas meter is located in the boiler room. The gas piping system is constructed of black steel and is in working condition. The exposed gas piping is not identified.

The technology shop has an air compressor is located on the mezzanine, but does not appear to be in use. The air outlets in the space are plugged. Welding gasses are supplied by portable tanks.

The 4" cold water service serving the building enters into the boiler room. A 4" water meter with bypass is provided on the cold water service at the point of entry into the building. The domestic water systems are constructed of copper and consist of cold water, hot water and hot water circulating piping. Some exposed water piping is partially un-insulated and some pipe insulation appears to be damaged. The domestic hot water for the building is being generated by two gas fired water heaters connected to a horizontal hot water storage tank located in the boiler room. The water heaters appear to have been replaced. The hot water storage tank is un-insulated and appears to be as installed at the time of building construction. The material or condition of the storage tank lining is unknown. The domestic water systems appear to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The plumbing fixtures consist of vitreous china floor mounted flush valve water closets; vitreous china wall mounted flush valve urinals; vitreous china wall mounted lavatories; floor mounted fiberglass bowl wash fountains in gang toilets, cast iron countertop sinks and stainless steel science sinks. Except for a few replacement urinals, the plumbing fixtures appear to be as installed at the time of construction and are in good condition. Some flush valves show wear but are functioning properly. The water closets and urinals do not comply with present water consumption requirements. Hot water is available to all lavatories and wash fountains tested. Handicapped accessible water closets are provided in the gang toilets but flush valve handles in some locations are not located on the side of the compartment with the most clear floor space. Handicapped accessible urinals and hand washing facilities are not provided. Electric water coolers are a combination of wall and floor mounted type. The water coolers are in fair condition and operate properly. Drinking fountains are vitreous china. Built in wall mounted showers with individual shower control valves and master water blending valves are provided in the boys' and girls' locker rooms. The showers do not appear to be used. Three station wall-mounted cast iron sinks are provided in the shops.

Deficiencies Noted

The water service is not equipped with a backflow preventer.

The hot water storage tank is un-insulated.

Some exposed water piping is partially un-insulated and some pipe insulation is damaged.

Handicapped accessible urinals and hand washing facilities are not provided.

Water closets and urinals do not comply with present water consumption requirements.

FIRE PROTECTION SYSTEM

Description of Systems

The building has a new fire alarm system, but is not equipped with a sprinkler system.

TECHNOLOGY INFRASTRUCTURE

Description of Infrastructure

Braddock Middle School is supported by a wireless network (microwave ring) supplied by Allegany County Public Schools. Internally, the school uses 10 gigabit counter rotating rings of single mode fiber optic cable between the MDF and the IDFs. The horizontal cable from the MDF or IDFs to the workstation locations is category 5 (Systimax) data cable. Voice horizontal cable is generally category 5 Systimax cable as well and the voice system is Voice over IP (VoIP). The VoIP equipment is located where the old phone switch was installed, not in the MDF. Equipment racks are generally 2-post, 7' equipment racks, however, the school would like to add a 4-post rack in the MDF to support server equipment as well as standard network components. The servers and other mission critical equipment are being supported by APC uninterruptible power supplies.

The school uses streaming video to the classrooms over the existing network from a Safari video distribution server. Most classrooms have approximately 4 data drops in them with the exception of the labs. There is a centralized alert system installed in this school. The school has wireless access points (WAPs) installed which provide adequate coverage for the public areas. They also have mobile computing carts with an additional WAP and 15 or more laptop PCs on each cart. The WAPs are secured with both WPA and WEP security systems and access is controlled from a centralized MAC address authentication data base. All WAPs are set up as "G" radios (54 mbps).

Deficiencies noted:

Equipment racks are not grounded.

Due to space restriction, a 4-post equipment rack cannot be installed in the MDF without removing partitions or reconfiguring the existing equipment. Servers are sitting on the floor because they cannot be installed in the 2-post racks.

There is no UPS support for the VoIP system.

Recommended Improvements:

- Ground all racks to a unified building ground to prevent differences in potential and to protect personnel.
- Reconfigure existing racks in the MDF to provide space for a 4-post rack or remove the partition to provide additional room for the new rack.
- Provide UPS support for the VoIP system to keep it up in the case of an emergency or power loss. UPS support must extend to both the VoIP equipment and the POE switches to maintain the voice connectivity.

ENERGY

Description of Energy

Braddock Middle School was built in 1965. The annual cost of operation is $115,119 which is approximately $1.16 per sq. ft.

The structure appears to be in very good condition and very well maintained. T-8 lamps and electronic ballast have been upgraded throughout the facility. If the ballast is instant start the bulbs can be upgraded to 28 watt bulbs.

The heating and ventilation system appears to be operating properly with the exception of the boys' locker room, which seems to be very hot. The air conditioning comes from window units that are in all the key areas. Also one of the back draft dampers on one of the power roof ventilators is stuck open and should be repaired before winter.

The unit ventilator in the shop area near the band saw should be taken off the hand position and placed back into automatic. If it does not operate in automatic it should be repaired. The shop storage lights can be up graded to screw in compact florescent for more energy savings.

Recommended Improvements

- All single pane windows should be replaced with a good quality thermo-pane without the reflectance because most of your degree days are heating.
- Update water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest water closet on the drain line to help flush the pipe with a little extra water.
- Update urinals to low consumption.
- Upgrade the gymnasium lighting to High Bay T-5 florescent lights. A photometric study should be done to insure that the lighting foot candles are achieved. (Minimum 50fc)

- Update systems to add air conditioning. Variable volume units are more efficient and work the best with parallel fan powered boxes or straight variable volume boxes. Series boxes are expensive energy wise and when the fan operates all the time it has higher maintenance costs. The units should have variable frequency drives and premium efficiency motors to complete the energy savings package.

Washington Middle School

Washington Middle School has approximately 98,500 square feet constructed in 1965 with an addition in 2000.

The 17 acres site has unpaved parking which needs improvement. The site amenities are not ADA accessible. Stairs leading to the baseball field and dugout should be re-built. The fields and court are in poor condition.

The roofing is in poor condition and has extended beyond warranty by a few years. Windows are original and do not have insulated panes. Doors throughout show age and many need upgrade and ADA hardware.

Many of the floors are asbestos tiles and should be replaced. The ceiling system is in poor condition and should be replaced.

Doors and hardware are not ADA compliant, and many areas of the building are not directly accessible. Notably the girl's locker room is upstairs from the gymnasium, although an elevator does service the second floor classrooms.

The restrooms are serviceable, but are in need of modernization. Some restrooms have been modified to accommodate disabled, but they are not fully accessible.

The concrete frame and brick exterior requires some re-pointing and caulking. The louvers for classroom ventilator are too close to exterior grade allowing mold and grass to grow at the openings.

ELECTRICAL SYSTEMS

Description of Systems

Electric service to the building is 240 volts, 3-phase, and terminates in a 3000 amp main switchboard containing several distribution breakers and a number of bus taps. This switchboard feeds multiple panelboards throughout the facility. Panelboards throughout the school are located in corridors, kitchen, stage and mechanical areas. The majority of the electrical distribution equipment is original to the building. This original gear is in working condition, but has limited spare capacity and, due to its age, replacement and new breakers may not be readily available. Most electrical distribution gear in the facility is by General Electric Company. Additional electrical panels and circuits dedicated for classroom computers were added as part of the *Technology in Maryland Schools* project in 2003. An emergency generation system is not present at this facility.

Lighting throughout the school is comprised of fluorescent, incandescent, and high intensity discharge lamp type fixtures. The majority of fluorescent fixtures in the school utilize T8 type lamps. The majority of lighting in the school was updated through a retrofit program sponsored by the electrical power company in 1990.

- Lighting in classroom spaces consists of pendant mounted fluorescent fixtures with acrylic diffusers. Lighting levels in classroom spaces are marginal.
- The cafeteria and most corridors throughout the school contain recess mounted 2'x2' parabolic type fluorescent fixtures. These fixtures are in good condition and provide adequate levels of illumination in these spaces. A small percentage of corridor lighting consists of surface mounted fixtures, original to the building, that have been retrofitted with compact fluorescent lamps.
- Locker rooms, small offices and some utility areas contain surface mounted fixtures with opal lenses. These fixtures are original to the building; some have been retrofitted with compact fluorescent lamps.
- Lighting in administrative areas consists of surface mounted fluorescent fixtures with acrylic lenses. These fixtures provide adequate lighting levels in most cases.
- The gymnasium contains high-bay type fixtures with metal halide lamps and acrylic lenses. These fixtures provide adequate lighting levels in this space and are in good condition.
- The auditorium and stage area contains recess mounted incandescent fixtures and stage lighting fixtures, all of which appear to be original to the building's construction. Lighting levels in the auditorium are adequate.
- Fixtures in other areas throughout the school, such as mechanical rooms, storage rooms, etc. contain a mixture of surface and pendant mounted fluorescent fixtures, most original to the building's construction.

Control of light fixture throughout the building is accomplished via manual switches, some of which are keyed. There is no bi-level control of fixtures in the school. However, some spaces do have alternate row type switching arrangements. No automatic lighting controls are present.

Wall-mounted incandescent fixtures with battery packs provide emergency egress lighting. Exit signs consist of both incandescent type as well as LED type, both with battery back-up. Building mounted exterior lighting consists of wall-pack type fixtures with high intensity discharge lamps.

Receptacles located throughout the building are 120V-20A. Many receptacles are original to the building construction. These original receptacles are sparsely located given the use of the building. In some areas, additional receptacle devices have been added as part of the *Technology in Maryland Schools* project in 2003. Surface raceway has also been added to many classrooms.

Deficiencies Noted

Due to the age of the original electrical distribution gear, its reliability and accuracy in providing overcurrent protection may be questionable. Also, the main electrical gear, some branch circuit distribution gear, and other disconnect switches and devices are located in the coal boiler room. This location results in the electric gear being coated with coal dust. Equipment in this room is not properly protected from contaminates and foreign materials.

Lighting in the main boiler room is not sealed. Due to the use of this space, sealed fixtures should be utilized.

Emergency egress lighting throughout the building is not adequately spaced in many locations, not providing the required egress illumination in the case of a loss of power. Also, several exit signs are either not working or their illumination levels are not adequate.

A limited number of branch circuit panelboards have missing cover devices resulting in exposed bussing.

Recommended Improvements

- Replace the existing 240V, 3-phase electric service to the building with a 480V, 3-phase electric service. Also, replace the existing switchboard with a new switchboard and provide step down transformers and 208V distribution panelboards to feed existing electrical gear remaining. Locate the new service gear in a dedicated, sealed space. Existing branch circuit panelboards throughout the school would remain in-use and would be repaired as necessary for NEC code violations. Test and replace as necessary the existing original electric gear that does not function (trip) properly.
- Replace all lighting throughout the school which is original to the building's construction. Areas that do not have original lighting will have the lighting replaced where illumination levels are not adequate for the space being served. Replace all lighting in the boiler room. Replace all fixtures using magnetic type ballasts. Install occupancy sensors and photocells throughout the school for control and energy

efficiency. Lighting that has been installed within the recent past (five years) could remain in use.

- Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights.
- Replace building and canopy mounted light fixtures with fluorescent type wall pack fixtures that would be controlled via a direct digital control system.
- Replace exit signs throughout the building. Replace and supplement existing emergency egress lighting with additional wall mounted battery pack fixtures.

HVAC SYSTEMS

Description of Systems

Building heat is provided by two coal-fired, hot water boilers. Hot water is distributed throughout the building by two base mounted pumps. There is no central cooling source.

- Classrooms are heated by heating-only unit ventilators located below windows on exterior walls. Cooling is typically not provided to classrooms except where residential type window air conditioning units have been installed. The upper level corridor is provided with multiple, high capacity exhaust fans to ventilate the building during summer months.
- The media center and associated ancillary spaces are served by a rooftop variable air volume (VAV) unit. The system incorporates packaged direct expansion cooling and hot water heat. The unit supplies air to VAV boxes equipped with dampers and hot water heating coils to spaces for individual temperature of each space or group of spaces served.
- The gymnasium is served by two heating and ventilating (H&V) units located in mechanical spaces off the boys and girls locker rooms. These units are equipped with hot water coils.
- The auditorium is served by a single H&V unit located in a mezzanine adjacent to the stage. This unit is equipped with a hot water coil.
- The administrative area is served by hot water convectors and multiple residential type split system air conditioning units or heat pumps.

In general, aside from the rooftop unit serving the media center, the administrative area split systems units and the window air conditioning units, most of the major HVAC equipment appeared to be original construction. HVAC controls are pneumatic.

Deficiencies Noted

The kitchen hood is not equipped with a fire suppression system. The school system has been granted a waiver to the requirements of NFPA 96 § 10.1.2 which requires fire suppression system for equipment that uses grease laden vapors. The school does not use such equipment.

Indications are that the age of the major equipment is approximately 40-45 years. The equipment condition appears to range between poor and fair. It appears as though the coal boilers have been well maintained. ASHRAE estimates that the statistical service life for equipment of this type would be in the range of 25-35 years and pneumatic controls approximately 20 years.

Recommended Improvements

- A complete HVAC renovation of the facility is warranted. The existing systems should be removed and replaced with new systems. Many factors would influence the type of system that might best serve the school. Based on information available at this time, it might be expected that a four pipe VAV system would be recommended. Classroom wings would be provided with central, variable air volume (VAV) systems consisting of air handling units with chilled water cooling coils and hot water heating coils to provide supply air to VAV boxes located in the spaces to allow for individual temperature control of the space or zone served. The cafeteria, kitchen, gymnasium, and similar spaces would each be served by a single zone air handling unit incorporating demand control ventilation. Ventilation air would be introduced at the air handling units. Heat would be supplied by multiple boilers and heating water would be pumped to coils located throughout the building as well as areas requiring baseboard heat. Central cooling would be provided by an air or water cooled chiller and chilled water would be pumped to coils located throughout the building. The systems would be controlled by the latest generation direct digital control system to provide safe, automated control of all systems and management of energy conservation functions.

PLUMBING SYSTEMS

Description of Systems

The sanitary waste and vent system appears to be a combination of cast iron, copper and PVC pipe and appears to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping. The waste piping from the two and three compartment sinks in the kitchen is PVC. A grease trap is located in the floor adjacent the three compartment sink.

The roof drainage system for the building is composed of a roof drains with interior water conductors that extend below the floor. The roof drain system for the canopies is roof drains with threaded steel rain water conductors. The roof drainage system appears to be working satisfactorily, but the condition of the piping is unknown. One roof drain does not appear to be set straight but appears to draining water from the roof.

The gas service enters the building at the boiler room and serves the gas fired water heaters located in the boiler room and gas fired cooking and dishwashing equipment in the kitchen. The gas meter is located in the boiler room. The gas piping system is constructed of black steel and is in working condition. The exposed gas piping is not identified.

A 4" cast iron cold water service, transitioning to copper, serving the building enters in the boiler room. A 4" water meter with bypass is provided on the cold water service at the point of entry into the building. The domestic water systems consist of cold water, hot water and hot water circulating piping constructed of copper. The hot water circulating pumps are cast iron construction. The exposed water piping in the boiler room is partially un-insulated and some of the pipe insulation appears to be damaged. The domestic hot water for the building is being generated by two gas fired water heaters connected to a hot water storage tank located in the boiler room. The water heaters and storage tank appear to be as installed at the time of building construction. The hot water storage tank is un-insulated. The material or condition of the storage tank lining is unknown. There is some corrosion or calcification between the steel storage tank and the copper water pipe tank connections. The domestic water systems appear to be working satisfactorily but the condition of the piping is unknown. There is no indication of repairs to the exposed piping.

The plumbing fixtures consist of vitreous china floor mounted flush valve water closets; vitreous china wall mounted flush valve urinals; vitreous china wall mounted lavatories; floor mounted fiberglass bowl wash fountains in gang toilets and countertop sinks. The plumbing fixtures appear to be as installed at the time of construction and are in good condition. Some flush valves show wear but are functioning properly. The water closets and urinals do not comply with present water consumption requirements. Hot water is available to all lavatories and wash fountains tested. Handicapped accessible toilet facilities are not provided. Electric water coolers are wall mounted type and appear to be replacement units. The water coolers are in good condition and operate properly. Built in wall mounted showers with master control and water

blending valves are provided in the boys' and girls' locker rooms. The showers do not appear to be used.

Deficiencies Noted

The water service is not equipped with a backflow preventer.

The hot water storage tank is un-insulated.

Some exposed water piping is un-insulated and some pipe insulation is damaged.

Handicapped accessible urinals and hand washing facilities are not provided.

Water closets and urinals do not comply with present water consumption requirements.

FIRE PROTECTION SYSTEMS

Description of Systems

A building is equipped with a partial sprinkler system is provided in the center portion of the building. The 4"sprinkler service connects to the domestic water service at the point of entry into the building ahead of the domestic water meter. A double check assembly backflow preventer is provided on the sprinkler service at the connection to the domestic water service.

Deficiencies Noted

No deficiencies noted.

TECHNOLOGY INFRASTRUCTURE

Description of Infrastructure

Washington Middle School is supported by a wireless network (microwave ring) supplied by the Allegany County Public Schools. Internally, the school uses 10 gigabit counter rotating rings of single mode fiber optic cable between the MDF and the IDFs. The horizontal cable from the MDF or IDFs to the workstation locations is category 5 (Systimax) data cable. Voice horizontal cable is generally category 5 Systimax cable as well and the voice system is Voice over IP (VoIP). Analog cards within the VoIP system provide the analog requirements within the building. Equipment racks are generally 2-post, 7' equipment racks, however, the school is converting to 4-post racks in the MDF to support server equipment as well as standard network components. The servers and other mission critical equipment are being supported by APC 3000 watt uninterruptible power supplies.

The school uses streaming video to the classrooms over the existing network from a Safari video distribution server. Most classrooms have approximately five data drops in them with the exception of the labs. The school has wireless access points (WAPs) installed, which provide adequate coverage for the public areas. They also have four (4) mobile computing carts with an additional WAP and 15 or more laptop PCs on each cart. Two (2) carts are on each level for teacher's use. The WAPs are secured with both WPA and WEP security systems and access is controlled from a centralized MAC address authentication data base. All WAPs are set up as "G" radios (54 mbps).

Deficiencies noted:
Equipment racks are not grounded.

Recommended improvements:
- Ground all racks to a unified building ground to prevent differences in potential and to protect personnel.
- Ensure that all closets or remote cabinets are connected to the MDF by fiber optic cable to maximize speed, security, and prevent interference.

ENERGY
Description of Energy
Washington Middle school was built in 1965. The annual cost of operation is $109,182 for all utilities which represents about $1.10 per sq. ft. The 1999 addition and office area, have central rooftop air conditioning units. The facility seems to be in very good condition. Maintenance staff is doing a great job keeping the facility looking well maintained.

The boiler room is in need of lighting, and some fixtures are still T-12 lighting. The Johnson Control pneumatic compressor pressure switch is not operating properly and will not start the compressor when the pressure drops below its set point. This component is the heart of the control system and should be replaced immediately. The thermostats in this facility should be recalibrated for a more even temperature in the rooms.

Most of the facilities have had a lighting upgrade to electronic ballast and 32 watt T-8 lamps. If the ballasts are the instant start they may be upgraded to 28 watt bulbs for even more energy savings.

Recommended Improvements:

- Repair the air compressor pressure switch.
- Replace the single pane windows with a good quality thermo-pane window without the reflectance, because most of your degree days are heating.
- Upgrade your gymnasium lighting to High Bay florescent lights. A photometric study should be done to insure that the lighting foot candles goals are achieved. (Minimum of 50fc)
- Update the water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest toilet on the drain line to help flush the piping with a little extra water.
- Update the urinals to low consumption.
- Emergency and LED exit lights should be placed on the emergency generator. This will eliminate all the labor and battery replacement costs.
- Update systems to add air conditioning. Variable volume units are more energy efficient and work the best with parallel fan powered or straight variable volume boxes. Series boxes are more expensive energy wise and when the fan operates all the time it has a higher maintenance cost also. The main units should have variable frequency drives installed and premium efficiency motors to complete the energy saving package.

Note: A couple of quick fixes were also observed:

- Repair window air conditioners fins that have been smashed flat and install heavy guards over them.
- Reinstall filter in unit ventilator by gym.
- Unwire damper control linkage and make repairs for automatic operation.

Building Condition Summary

All of the buildings appeared properly maintained; however, wear and tear from years of use is evident on all but the most recently renovated portions of each building. Construction prior to 1990 typical needs thermally insulated windows, doors and better insulation to meet current energy conservation standards. Additionally the life-span or these building elements is about 20 years. Therefore, four of the five schools assessed will need major improvement if they are going to stay in service. The most critical improvements are in the areas of HVAC, electrical, and ADA.

The terrain at each school is sloping, which created a challenge to meet the Americans with Disabilities Act (ADA) implemented in 1990. The school district has made many efforts to provide elevators and ramps however door way, restroom and other maneuvering clearances are difficult to address without a major renovation or building replacement.

The Fort Hill High School renovation in 1992 is a prime example of renovation recommended for buildings constructed prior to 1990, as it appropriately addressed items noted above.

General Observations/Recommendations Related to Technology

Description of Network

The overall wide area network (WAN) reportedly is stable and provides adequate bandwidth for the administrative and instructional needs of the district; however, this infrastructure is comprised of non-licensed frequency wireless transmissions. Being non-licensed, the radio frequencies being used are not protected for the school district's use. The district is at risk of another entity encroaching on the wireless transmission spectrum, potentially reducing or even eliminating the connections between school buildings.

The school system has been on a Novell based network since its inception. There is a project current underway to migrate the network to a Microsoft Active Directory authentication. This project is expected to take one to two years to complete district-wide. This strategy is a positive move for ACPS. New servers have been purchased to accommodate the new network and to "house" the legacy Novell servers until the migration is completed. Most of the new servers were observed being stacked on one-another on the floor. The exhaust ports of the servers and switch gear were generally restricted by an accumulation of dust.

The ACPS server migration is moving multiple servers (AD, Files, and Novell servers) onto a single piece of hardware using VMware. This is a great strategy and is recommended; however, there was no indication of providing a failover server at each school should the new server fail. The schools do not employ proxy server capabilities, which are highly recommended given the redundant websites accessed by students and classes. Proxy services reduce the amount of Internet traffic both inbound and outbound, which frees up resources for all users and extends the useful life of network infrastructure.

The desktop computers appear to be generally in good condition. It was reported that these computers are generally on a refresh cycle within each school. It was also noted that ACPS has standardized on Lenovo (IBM) products and has almost eliminated Apple and "white box" computers from its inventory. Standardizing on a manufacturer as ACPS has, is highly recommended. Virtual Device/Desktop Interface (VDI) is a complementary network service through VMware. VDI is the future of computing for schools and large organizations and can extend the useful service life all desktop hardware, thereby all but eliminating wholesale refresh cycles of desktop computers.

Deficiencies noted:

Most of the server closets were excessively cluttered and quite warm despite it being a very cool day.

Equipment ventilation was restricted significantly by dust accumulation.

The servers represent a single point of network failure, which is multiplied by two since there is not a failover server available at each school.

Internet proxy services were not present.

Recommended Improvements:

- ACPS is using unlicensed frequency wireless equipment. Upgrade the non-licensed wireless infrastructure used for the WAN to either a licensed frequency or a fiber cable infrastructure. This will ensure adequate future bandwidth and connectivity.
- Servers are at risk of being knocked over and permanently damaged. Install server racks as soon as possible and mount the servers in them.
- Exhaust and/or cool the server closets. (Most appeared to have this capability, but it was not running.)

- The server closets need to be in a preventive maintenance schedule that includes removing an accumulation of clutter in the closets and vacuuming the switches' and servers' cooling grilles.
- Install a failover server at each school. This can be initially accomplished by using older hardware until resources permit installation of a new server.
- The failover server could be also purposed to provide proxy services for the school.
- VDI should enter a pilot phase as soon as possible. The sooner it can be employed, the sooner technology financial resources can be used on other needed projects.

General Observations/Recommendations Relative to Energy Related Improvements
Allegany County Public Schools that were visited on this survey were found to be in very good condition and well maintained.

The Energy Education Program that was instituted in 2002 is working well as far behavior and operational modifications. There were not any unoccupied areas that had lights on.

- All of the HID lighting found in the gyms, shop or any other area should be changed to High Bay Florescent T-5 fixtures. A photometric study should be scheduled prior to installation to achieve proper foot candles per sq. ft. of surface area.
- Retro-Commissioning should be performed on facilities that are 10 years old or older. This will improve indoor air quality along with energy savings. The firm selected should be certified by one of the following national organizations: National Environmental Balancing Bureau, American Air Balancing Council or Association of Energy Engineers.
- Performance Contracting should be considered as a strategy to improve facilities by using energy savings to pay for the projects. The cost-neutral guaranteed savings could be a "win win" for everyone.
- Mechanical renovations should include central units with air conditioning and parallel fan powered variable volume or straight variable volume boxes. Variable frequency drives will control the static pressure in the systems and premium efficiency motors should be selected. These components offer economy and durability in these systems.
- Plumbing renovations should include low consumption water closets and urinals.
- Thermo-pane windows should be installed to improve each structure's envelope against heat transfer.

Facility Improvements/Priority Summary by School

Allegany HS	Priority A	Priority B	Priority C	(20XX)
ADA:	**$ 920 - 1070K**			
Replace or upgrade doors and hardware	320 - 370K			
Modernize and upgrade restrooms to make them accessible	600 - 700K			
Electrical System:	**$ 2.28M**			
A Replace all electrical distribution gear that was not replaced as part of the 1982 renovation	680K			
A Perform a major lighting upgrade	1.35M			
B Replace the stage lighting and dimming system	250K			
Energy:				
Upgrade Windows and Doors for energy efficiency	1.2 - 1.4M			
Perform a major lighting upgrade throughout the building	X			
Install occupancy sensors and photocells throughout the school for control and energy efficiency		X		
Lighting installed as a part of the 1982 renovation would be assessed on a space by space basis. Lighting that was installed in the renovation of the science labs and library could remain in operation		X		
Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights		X		
Replace building mounted light fixtures with fluorescent type wall pack fixtures that would be controlled via a direct digital control system	X			
Replace exit signs throughout the building	X			
Replace and supplement existing emergency egress lighting with additional wall mounted battery pack fixtures	X			
General:	**$ 220 - 290K**			
A The building envelope needs brick repair and re-pointing	200 - 250K			
B Consider weather protecting exterior ramps	20 - 40K			
HVAC:			**$ 5.2 - 6.1M**	
A A complete HVAC renovation of the facility is warranted			5.2 - 6.1M	2011

Allegany High School, cont.

Structural:				
Clean and paint the rusted lintels and re-point the cracks in the brick veneer of the building envelope.	X			
Repair the cracks in the exterior concrete stairs, steps and landings	X			
Patching where rail post embeds have cracked and spalled the concrete, and set the rail post base on top of the concrete in lieu of embedding	X			
Patch the cracks in the exterior brick retaining walls and providing weep holes to relieve the water behind the walls	X			

Plumbing:				
Install backflow preventers on the cold water services	X			
Upgrade the water closets and urinals to comply with present water consumption requirements		X		

Technology:	$ 435 - 565K			
Ground all racks to a unified building ground to prevent differences in potential and to protect personnel	X			
Install bushing on conduits if additional cables are going to be pulled through them. This will protect the jacket of the cable from cuts, scrapes, and other damage to the cable from the metallic conduits		X		
Ensure adequate ventilation in all closets	X			
Ensure that all closets or remote cabinets are connected to the MDF by fiber optic cable to maximize speed, security, and prevent interference.				
Consider upgrading the fiber optic cable to single mode fiber which can provide 10 gig backbone speeds		X		
* If HVAC replaced a Structured Cable replacement is waranted	435 - 565K			

Fort Hill HS	Priority A	Priority B	Priority C	(20XX)
Electrical System:	**$ 625 - 865K**			
Replace all fixtures utilizing T12 lamp and magnetic ballast technology with similar type fixtures utilizing T5 or T8 lamps with electronic ballasts. Add fluorescent type building mounted light fixtures that would be controlled via a direct digital contr	625 - 865K			
Energy:				
Upgrade the gymnasium lighting to High Bay T-5 florescent lights. A photometric study should be done to insure that the lighting foot candles are achieved. (Minimum of 5 ofc)	X			
Upgrade the work lights behind the curtain on the stage to florescent fixtures for more constant working light	X			
Update the water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest toilet on the drain line to help flush the pipe with a little extra water	X			
Update the urinals to low consumption	X			
Emergency and LED exit signs should be placed on the emergency generator	X			
Update systems to add air conditioning	X			
HVAC:				
A complete HVAC renovation of the facility will required			X	2021
Roof:			**$ 300 - 350K**	
Replace the roofing for academic portion of building			300 - 350K	2011
Structural:				
Patch the damaged areas of concrete around the building	X			
Patch the deteriorated concrete steps at the gymnasium should be patched	X			
Replace the retaining wall that receives the rail post, at the front stair, setting the rail post on top of the new wall in lieu of embedding	X			
Plumbing:				
Provide covers on the handicapped accessible lavatory water supplies and trap	1K			
Install backflow preventers on the water services	X			
Upgrade the water closets and urinals to comply with present water consumption requirements		X		

Fort Hill High School, cont.

Technology:				
Ground all racks to a unified building ground to prevent differences in potential and to protect personnel	X			
All core drills should have sleeves with insulated bushings installed in them prior to having cables installed		X		
All vertical pathways (core drills) need to be firestopped as a life safety issue	X			

CCTE	Priority A	Priority B	Priority C	(20XX)
ADA:	**$195 - 258K**			
Upgrade doors and hardware in original building	125 -150K			
Make all restrooms fully accessible in original building	50 - 80K			
Make the needed ADA upgrades in the Annex	20 - 28K			
Electrical System:	**$ 1.0M**	**$ 35K**	**$ -**	
Replace all lighting throughout the school which is original to the building's construction.	1.0M			
Provide a basic dimming system for the auditorium space, replacing a portion of the fixtures with dimmable fluorescent fixtures of the same type.		35K		
Energy:	**$ 700 - 800K**			
All single pane windows should be replaced with a good quality thermo-pane without the reflectance because most of your degree days are heating.	700 - 800K			
Update water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest water closet on the drain line to help flush the pipe with a little extra water.	X			
Update urinals to low consumption.	X			
Update systems to add air conditioning	X			
Emergency and LED exit lights should be put on the emergency generator. This will eliminate the labor and battery costs.	X			
The Annex should have the lighting upgraded to T-8's.	X			

CCTE, cont.

General:		$ 624 - 630K		
The Annex needs exterior painting. Asbestos floor tile replacement		24 -30K 600K		

HVAC:			$ 4.0 - 4.7M	
A complete HVAC renovation of the total facility is warranted.			4.0 - 4.7M	2011

Roof:			$ 550 - 650K	
Replace the roof on the original building			550 - 650K	2014
Replace the roof on the addition			120 - 150K	2014

Structural:				
Patch the concrete curb damage outside of door A2 and place the rail post supports on top of the curb in lieu of embedding.	X			
Rebuild the cracked corner of the exterior brick planter and provide weep holes to relieve the water behind the planter wall.	X			
Replace the failed retaining wall to maintain the grade at the storage building	X			

Plumbing:	$ 1K			
Provide covers on the handicapped accessible water supplies and trap.	1K			
Install backflow preventers on the water services.	X			
Upgrade the floor mounted water closets to comply with present water consumption requirements.		X		

Technology:	$ 350 - 460K			
POE switches and VoIP equipment should be supported by UPS power to prevent the phone system from becoming inoperable during power outages.	X			
Install servers in a 4-post rack to prevent damage to the equipment and improve accessibility within the MDF.		X		
* If HVAC replaced a Structured Cable replacement is waranted	350 - 460K			

Braddock MS	Priority A	Priority B	Priority C	(20XX)
ADA:	**$ 600 - 680K**	**$**	**0**	
Address accessibility issues from site to building	150 - 200K			
Replace/upgrade exterior doors/hardware for ADA compliance	50 - 60K			
Modernize and upgrade restrooms to make them accessible	400 - 420K			
Electrical System:	**$ 938K**	**$ 150K**	**$ -**	
Replace the existing 208V, 3-phase electric service to the building with a 480V, 3-phase electric service. Also, replace the existing switchboard with a new switchboard and provide step down transformers and 208V distribution panelboards to feed existing	198K			
Perform a major lighting upgrade throughout the building	740K			
Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights		150K		
Energy:				
All single pane windows should be replaced with a good quality thermo-pane without the reflectance because most of your degree days are heating	700 - 800K			
Update water closets to low consumption. Save a few of the higher consumption water closets to be installed at the furthest water closet on the drain line to help flush the pipe with a little extra water	X			
Update urinals to low consumption	X			
Upgrade the gymnasium lighting to High Bay T-5 florescent lights. A photometric study should be done to insure that the lighting foot candles are achieved. (Minimum 50fc)	X			
Update systems to add air conditioning	X			
General:	**$ 1.08 - 1.29M**			
Repair the asphalt	80 - 90K			
Replace the asbestos floor tile	1.0 - 1.2M			

Braddock Middle School, cont.

HVAC:			$ 3.0 - 3.5M	
A complete HVAC renovation of the facility is warranted			3.0 - 3.5M	2011

Roof:			$ 750K	
Replace the roof			750K	2011

Structural:				
Re-pointing the exterior brick façade where mortar is deteriorated	X			
Clean and paint the rusted lintels	X			
Repair the concrete damage at the exterior elevated concrete stairs	X			

Plumbing:				
Install backflow preventers on the water services	X			
Insulated the hot water storage tank		X		
Cover exposed water piping that is partially un-insulated and repair damaged insulation		X		
Provide handicapped accessible urinals and hand washing facilities		X		
Upgrade the water closets and urinals to comply with present water consumption requirements		X		

Technology:	$ 250 - 320K			
Ground all racks to a unified building ground to prevent differences in potential and to protect personnel	X			
Reconfigure existing racks in the MDF to provide space for a 4-post rack or remove the partition to provide additional room for the new rack		X		
Provide UPS support for the VoIP system to keep it up in the case of an emergency or power loss. UPS support must extend to both the VoIP equipment and the POE switches to maintain the voice connectivity	X			
* If HVAC replaced a Structured Cable replacement is waranted	250 - 320K			

Washington MS	Priority A	Priority B	Priority C	(20XX)
ADA:	**$ 605 - 645K**			
Rebuild stairs leading to baseball field and dugout	25K			
Upgrade doors and hardware	180 - 200K			
Modernize restrooms and make them ADA accessible	400 - 420K			
Electrical System:	**$ 1.05M**	**$ 150K**		
Replace the existing 240V, 3-phase electric service to the building with a 480V, 3-phase electric service. Also, replace the existing switchboard with a new switchboard and provide step down transformers and 208V distribution panelboards to feed existing	410K			
Perform a major lighting upgrade throughout the building	640K			
Replace the stage lighting and dimming system with a digitally controlled, electronic dimming system with new stage lights.		150K		
Energy:	**$ 650 - 750K**			
Repair the air compressor pressure switch.	X			
Replace the single pane windows with a good quality thermo-pane window without the reflectance.	650 - 750K			
Upgrade your gymnasium lighting to High Bay florescent lights.	X			
Update the water closets to low consumption.	X			
Update the urinals to low consumption.	X			
Update systems to add air conditioning	X			
Emergency and LED exit lights should be placed on the emergency generator.	X			
General:	**$ 1.8 - 2.0M**	**$ 90 - 100K**		
Improve unpaved parking area		90 -100K		
Replace asbestos floor tile	800 - 900K			
Replace ceiling system	780 - 800K			
Re-point and caulk the concrete frame and brick exterior	200 - 300K			
HVAC:			**$ 3.0 - 3.5M**	
A complete HVAC renovation of the facility is warranted			3.0 - 3.5M	2011

Washington Middle, cont.

Roof:			**$750K**	
Replace roof			750K	2011

Structural:				
Address the roof drainage and provide outlets beyond the building limits.	X			
Re-pointed the exterior brick stair wall and seal the crack.	X			

Plumbing:				
Install backflow preventers on the water services.	X			
Insulated the hot water storage tank.		X		
Cover exposed water piping that is partially un-insulated and repair damaged insulation.		X		
Provide handicapped accessible urinals and hand washing facilities.		X		
Upgrade the water closets and urinals to comply with present water consumption requirements.		X		

Technology:	**$245 - 320K**			
Ground all racks to a unified building ground to prevent differences in potential and to protect personnel.	X			
Ensure that all closets or remote cabinets are connected to the MDF by fiber optic cable to maximize speed, security, and prevent interference.		X		
* If HVAC replaced a Structured Cable replacement is waranted	245 - 320K			

Cost Model

School construction is funded at the state level in Maryland. Because of this the Director of Facilities asked Dr. David Lever, Executive Director of the Maryland School Construction Program to discuss this issue with the Community Resources Committee. On February 18, 2010 Dr. Lever met with the Committee to provide information and answer questions. A copy of his presentation detailing the State's school construction cost model is included in the Appendix of this report.

The conclusion drawn from this discussion was that, given the age and condition of the schools in the study, the level of funding that would be available from the state would not be significantly different regardless of whether the recommendation was to renovate existing schools or build new ones.

EDUCATIONAL ADEQUACY

The educational adequacy assessment evaluates how well each school is equipped to deliver the curriculum. It assesses the facility's size, use, quality and quantity of space as related to the education program it delivers and how that may compare or agree with newer facility space within the system and, more importantly, future educational needs.

The following information was outlined in a discussion with Allegany County Public Schools (ACPS) administration resources and secondary level administrators.

Allegany County Secondary Schools Current General Practices

In the recent economic climate, Maryland school divisions reviewed goals and practices relating to student-teacher ratios in an effort to balance funding concerns with local educational practices. ACPS endorses an average of 25 students per class as an upward cap on class size at the middle and high school levels.

Placement of special education classes that are self-contained in nature tend to move between schools based on student mobility and/or identification of new students in relationship to the location of the school. Therefore, from year-to-year classroom space may be required that is different from the prior school year. This affects the capacity of the facility.

Allegany County High School Current Programs & Practices

The high schools in Allegany County operate on a seven period day, with 43-45 minute class periods, grades 9 through 12. This is new this year for all high schools. Currently students need 21.5 credits for a standard diploma; however, the diploma system is under review by the Curriculum Committee. Beginning with the class of 2012, students must meet an additional half credit requirement by taking Personal Financial Literacy, bringing the total number to 22 credits for a standard diploma.

General characteristics of comprehensive high school programs include:

- Dual enrollment opportunities (college level courses taken on the high school campus) in local college include core areas and psychology, speech, etc. There are ten course opportunities available for the 2010-2011 school year.
- Students must take one credit of physical education during high school, usually in earlier grades; they can also take other related courses as electives (such as fitness, weight training, etc.)
- Elective choices are largely fine arts.
- The students leave middle school with a defined career cluster that determines course selection. Currently the students at FHHS and AHS participate predominantly in courses with large technology influence (tech ed, business ed, web design, etc.) One option is the school- within-a-school model that is not in competition with the Center for Career & Technical Education (CCTE) – potentially receiving early courses (grades 9/10) at the comprehensive school, then completing at CCTE.
- Maryland allows seniors to take an abbreviated schedule if enrolled in English and have enough credits to graduate. This is known as 'English and Out.' About 33% of Allegany County seniors exercise this option.
- Current 10th graders are required to take a financial literacy course in their junior or senior year.
- Science, Technology, Engineering and Math (STEM) programs are becoming a greater focus on both the high and middle schools levels. These will require the development of ancillary programs such as Geographic Information Systems (GIS), technical writing, and research.
- 74 – 80% of seniors go on to higher education (including military)

The Center for Career and Technical Education serves the skill training needs of students from the high schools in Allegany County by offering seventeen different career and technical programs. In addition, the academic curriculum is comparable to courses offered at the comprehensive high schools and students are eligible to participate in extracurricular activities at their comprehensive high schools. Students who complete a two (2) - year program at CCTE are prepared for entry-level employment or are able to pursue further study at various postsecondary institutions. Articulation agreements exist with partnering institutions whereby students are afforded college credit for CCTE programming.

General characteristics of the CCTE programs include:

- 4 periods a day, with an A/B week schedule. (Students can get 8 credits a year).
- Every other week is academic in week A
- Week B is skill week
- All day program, with diploma from home high school. Current student enrollment is about 40% each from FHHS and MRHS and 20% from AHS
- Students can be involved in comprehensive high school's clubs and athletics
- Fire and rescue program is held at the training facility off site
- All programs meet local need
- All programs are State Department endorsed
- Declining enrollment recently due to competing venues with comprehensive high schools

Allegany County Current Middle School Programs & Practices

The middle schools in Cumberland City operate on a nine period day, with 41-42 minute class periods, grades 6 through 8. Student schedules consist of primary core subjects (math, science, English, social studies), PE, and a rotation through elective subject offerings (art, music, family and consumer science, tech ed).

General characteristics of middle school programs include:

- Students are heavily involved in art, music, and band.
- Science – not adequate lab spaces – made into computer labs several years ago
- Currently available world language courses as enrichment subjects include French and Spanish; however, the State is requiring 'access to world language' by 2011 for students in the middle years. ACPS is currently considering a nine-week world languages experience in grades six and seven and a full-year, four credit option in grade eight. The implication is there will be at least three full classrooms at the eighth grade level required to implement this program.
- Group homogeneously
- Autistic/cognitively limited/severe and profound – currently center-based at Washington Middle School; regional setting moves from place to place based on available space (see notation under ACPS general practices).
- Tech ed in the middle school – trades initiative – local community effort – building trades elective/pairing to technology standards/computer labs
- Family and Consumer Sciences for all grades includes instruction in foods and nutrition, some consumer/finance and sewing, some child development
- Buildings were constructed as Junior High Schools – not true middle school model

General Description of Instructional Technology

Classroom instructional technologies have quickly expanded beyond desktop computers, servers, and Internet connectivity over the past fifteen years. These resources now include LCD projectors, interactive whiteboards (e.g., SmartBoards), visual presenters (e.g., document cameras and ELMOs), sound systems, classroom polling systems (CPS), video content services, voice reinforcement/enhancement system, and handheld computing devices (e.g., probe-ware).

It was observed that ACPS provides some of these capabilities; however, in many instances these are limited. The most prevalent instructional technologies were LCD projectors and a classroom speaker. This appears to be a significant first step toward a system-wide standard. Generally a single speaker per classroom is not adequate for listening equity in classrooms, particularly if they are located in the front of the classroom – compared to being placed in the relative center of the desks.

A few interactive whiteboards and visual presenters were observed. The placement strategy for the interactive whiteboards (i.e., department or grade level) began with a focus on science and math at the middle and high school level. Installation was based on teacher interest and agreement to training through their content. At the end of the 2010/2011 this rotation will be completed. In addition, during the 2009/2010 school year smart board technology was implemented in language arts at the middle school level. In the next allocation, language arts at the high school level will be the focus. In addition, social studies teachers have agreed to the implementation of this technology once funding is approved and available. Every school has a video content server. These are highly recommended instructional tools.

The instructional technologies that were not observed included: classroom polling systems, voice enhancement, and handheld computing devices (other than graphing calculators).

Changing Programs & Practices

Changing High School Educational Considerations and Goals

- FHHS and AHS are offering more college credit courses.
- Facilities for extra curricular activities are lacking softball and baseball are all off campus. Allegany has same issues with soccer, baseball having practices at other locations, they only have one gym.
- Continue to integrate technology more deeply into instruction
- Aqua Culture Program at FHHS start up looking for grant funding
- The division is attempting to upgrade the facilities at the stadium which resides on the FHHS site.
- The AHS Foundation is considering the funding of a foreign language lab.
- CCTE undergoing implementation of Culinary Arts program, the programs are requiring more rigor.
- Program delivery is requiring more small group pull out and/or work area for project-based curriculum
- Well-designed and supported programs with ability to be sustained, and based in a long term plan. (i.e. early college experience) will be important.
- Offering of additional online courses -- requires technology and staffing to support the online learning/learners.
- High school focus is STEM, integrated lab experience (Maryland Higher Education requires 4 year of math to attend a 4 year institution)
- Conversations on "completer" college programs i.e. teacher academy.

Changing Middle School Educational Considerations and Goals

- Duration of class periods -- looking at the implications to space availability at the middle school as move to block scheduling
- Greater integration in instructional programs? i.e. STEM (Cumberland middle schools do not currently have science labs)
- Advisory program planned for a year down the road
- The recently released State and Local Middle School Task Force reports have implications for space utilization. The implementation task force is looking at issues, funding, timing, and needs across the county.
- Piloting a building trades program in Washington using existing space (tech ed labs)
- Washington looking to link to the science programs offered at FHHS
- Both student and community need for increased physical education/fitness/athletic space

Assessment of Limiting Factors

Allegany High School

- AHS operates on an average PTR in core subject areas over desired local program ratio of 18:1; the elective and technical courses run on desired average PTR, but some courses utilize large areas of space for smaller groups of students for a small portion of the day.
- The facility's physical layout, with several level changes, makes it difficult to group classroom areas in various configurations – so interdisciplinary instruction would be difficult at best.
- Ability to integrate technology fully into the curriculum is severely limited by inadequate electrical supply
- Science facilities cannot support future programs in current state
- Building layout does not support a move to more integrated core and elective instruction required of future programs such as the STEM initiative and online instruction.
- There are little or no resource areas for teachers to work together close to their classroom area.
- There are little or no designated conference areas that could be used for a variety of staff and student development uses.
- While the original façade is beautiful, it does not provide a clear sense of arrival or entry to the facility for most students and community.
- Hallways are small, there are many dead-end corridors, and the general layout is confusing.
- The library and cafeteria facilities are in need of upgrading and modernizing as a true student resource.
- The school site is inadequate for student and community parking, and does not provide for athletic (or even physical education) play areas.

Fort Hill High School

- FHHS operates on an average PTR in core subject areas over desired local program ratio of 18:1; the elective and technical courses run slightly below desired average PTR while arts and music education courses run higher. As a result, some courses utilize large areas of space for smaller groups of students for a small portion of the day.
- The recent renovation to the facility provides for an efficient layout for current instructional delivery, but may provide challenges if a more integrated approach to core/technical instruction were desired. There continue to be some areas of the building where level changes make it difficult to reach program areas, and these appear difficult to effectively supervise.
- While the facility is conducive to providing for a variety of program, student, and teacher needs, it may be considered inefficient in space use, as some full sized spaces are utilized for teacher workrooms, conference rooms, computer labs, and support programs. It may be worthwhile to do a program comparison/analysis with the recent MRHS to consider a layout that expresses the use of space based on program design rather than 'where it fits.'

Center for Career and Technical Education

- CCTE operates on an average PTR in core subject areas and technical programs under the desired program ratio. Classroom size/space use is not efficient as a result.
- While currently upgrading program space (i.e. Culinary Arts), the two-building facility is not conducive to integration of core subject areas with technical areas. This tends to emphasize the former 'vocational' image, rather than the move toward a strong career/technical model and image shown by program initiatives over the past few years.
- Student gathering/team work areas and teacher professional space is lacking

Braddock Middle School

- BMS operates on an average PTR in core subject areas over desired local program ratio of 18:1; the elective rotation runs under the desired PTR, but the music program has a robust PTR far exceeding desired ratios.
- The facility's physical layout, with several level changes and long bridges to access building areas, makes it difficult to group classroom areas in various configurations – so interdisciplinary instruction would be difficult at best. This is also a concern for student discipline and safety.
- Designed as a junior high, not middle school – does not support middle school concept of teaming academically

- Inadequate (no) science labs for middle school instruction
- If music program continues to be a strong student choice trend, facilities must be upgraded to reflect appropriate size and storage needs.
- Several teachers share instructional space – no professional space available for team planning/conferencing. There are a number of teachers that rotate throughout the building based on classroom availability (teacher is on planning or lunch) using a cart for supplies and instructional materials.
- Current instructional labs for electives are outdated
- Additional gymnasium space needed
- The library and cafeteria facilities are in need of upgrading and modernizing as a true student resource.
- The sense of entry, for the middle school population, should be welcoming and warm.

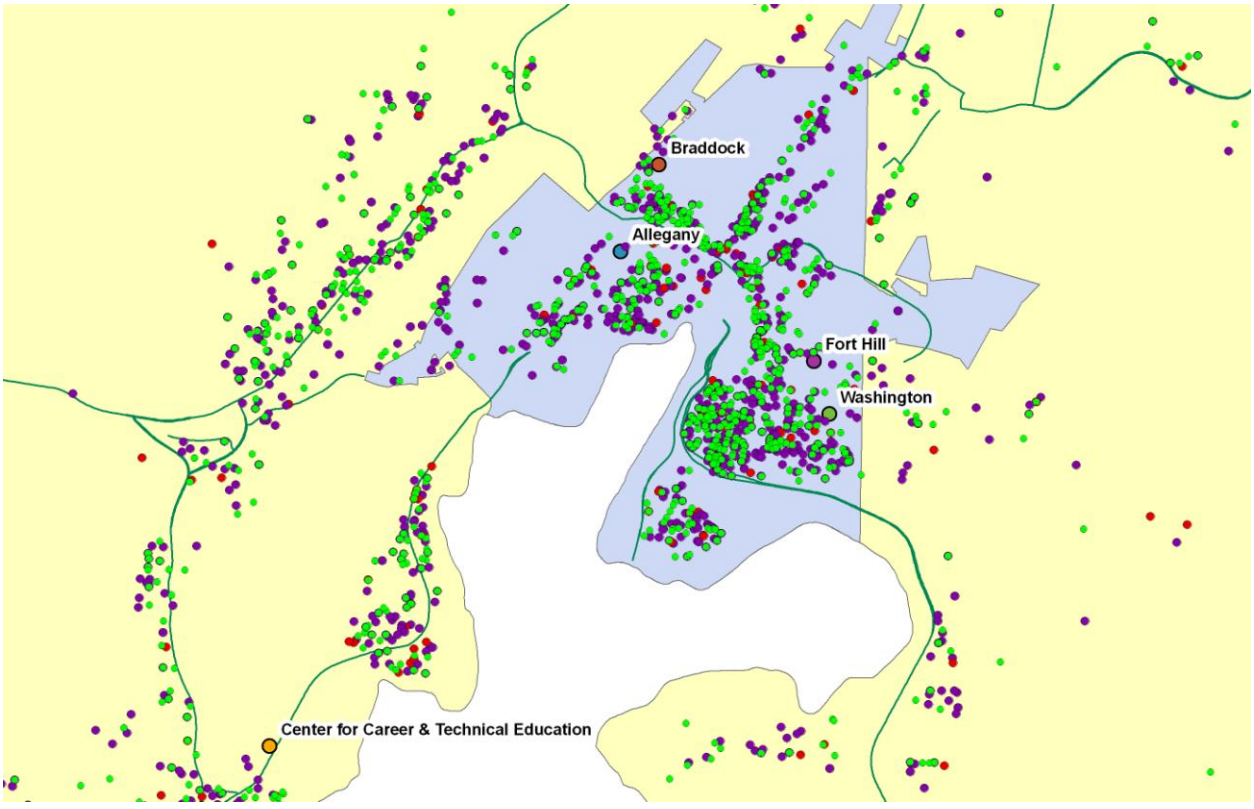
Washington Middle School

- WMS operates on an average PTR in core subject areas over desired local program ratio of 18:1; the elective rotation runs slightly under the desired PTR, but the music program has a robust PTR far exceeding desired ratios.
- Designed as a junior high, not middle school – does not support middle school concept of teaming academically.
- Inadequate (no) science labs for middle school instruction
- If music program continues to be a strong student choice trend, facilities must be upgraded to reflect appropriate size and storage needs.
- Several teachers share instructional space – little professional space available for team planning/conferencing
- Current instructional labs for electives are outdated
- Additional gymnasium space needed
- The library and cafeteria facilities are in need of upgrading and modernizing as a true student resource.
- The sense of entry, for the middle school population, should be welcoming and warm.

Student Geocoding

A student database was provided by ACPS and downloaded on September 30, 2009. The file was comprised of 9498 student records. In analyzing the data it was discovered that seven students had duplicate records due to them being enrolled in the Evening High School program as well as their zoned high school. These records were removed leaving a data set of 9491 students. The student data was loaded to the GIS software and geocoded. Only 3% of the students could not be geocoded, due to either bad address data or not residing in the county. The remaining 97% of the students were then zoned to establish the correct school attendance boundary for further analysis if needed.

The following map displays the student population of this study: high school students are shown in purple, middle school students in green, and Career Technical students in red.



Enrollment Projections and Analysis

Eperitus studied in detail multiple sets of data related to student enrollment trends in Allegany County. The projected enrollment for 2014 and 2019 is summarized below. **Projections are based on K-12 enrollments; therefore, Pre-Kindergarten enrollment is not included. The Pre-K enrollment for October, 2009 was 460 students.**

DIVISION K-12 ENROLLMENT PROJECTIONS
(does not include Pre-K)

	Actual 2009	Projected* 2014	Projected* 2019
Total Enrollment	8,698	8,450	8,360
Elementary School Enrollment	3,878	3,850	3,850
Middle School Enrollment	2,019	1,950	1,910
High School Enrollment	2,801	2,650	2,600

*All projections rounded no more than +/- 5.

Enrollment Projections by School

	Actual 2009	Projected* 2014	Projected* 2019
Allegany High School	773	740	730
Fort Hill High School	806	765	750
Braddock Middle School	616	600	590
Washington Middle School	648	625	610
CCTE	306	285	275

*All projections rounded no more than +/- 5.

ENROLLMENT DATA SETS

The following tables present several of the key data sets Eperitus developed that served as the foundation for the enrollment projections. A variety of analyses are needed to formulate the overriding trend.

Total K- 12 Enrollment History

Allegany County school enrollment has declined by 15% since the year 2000. The average annual decline has been approximately 165 students. In two of the last three years enrollment has declined by fewer than 100 students.

2000	10,179
2001	9,889
2002	9,862
2003	9,606
2004	9,451
2005	9,323
2006	9,090
2007	8,999
2008	8,746
2009	8,698

Kindergarten Enrollment

For the first three years of the decade kindergarten enrollment averaged over 665 students annually. From 2003 to 2006 the size of the kindergarten class averaged fewer than 620 students, with the two lowest years of the decade being 2004 and 2006. Since 2007 the average size of the kindergarten class has increased to just over 635 students.

2000	667
2001	645
2002	694
2003	623
2004	603
2005	643
2006	607
2007	659
2008	615
2009	635

Enrollment by Grade Level

In 2009 the average size of grades 9-12 is 700 students. The average for grades K-3 is just over 640 students. At this level, over time, as the larger groups of older students move out of the system and are replaced by smaller groups similar in size to the current K-3 groups, that should sustain an overall enrollment for the school system of 8300-8400 for the next ten years."

Enrollment by Grade Level – Fall 2009

K	635	7	680
1	634	8	650
2	656	9	692
3	641	10	700
4	675	11	736
5	637	12	673
6	689		

Cohort Growth Trends – Birth to Kindergarten

Since 2005 the ratio of students enrolled in kindergarten as compared to the reported number of babies born to residents of Allegany County five years earlier has steadily increased from a low of .81 to a high of .99 in 2009.

Birth Year	# Births	K-Year	# Students	Ratio
2000	794	2005	643	.81
2001	708	2006	607	.86
2002	712	2007	659	.93
2003	675	2008	615	.91
2004	641	2009	635	.99

Cohort Growth Trends – Kindergarten to 5th Grade

For the cohort growth trends on the next three tables, there is a remarkable consistency in the size of the grade level groups as they move through the system from grade level to grade level starting in kindergarten.

K Year	# Students	5th Year	# Students	Ratio
2000	667	2005	661	.99
2001	645	2006	657	1.02
2002	694	2007	689	.99
2003	623	2008	679	1.09
2004	603	2009	637	1.06

Cohort Growth Trends – Grades 5 through 8

5th Year	# Students	8th Year	# Students	Ratio
2002	752	2005	759	1.01
2003	746	2006	747	1.00
2004	678	2007	673	.99
2005	661	2008	677	1.02
2006	657	2009	650	.99

Cohort Growth Trends – grades 9 through 12

9th Year	# Students	12th Year	# Students	Ratio
2002	839	2005	819	.98
2003	815	2006	741	.91
2004	850	2007	758	.89
2005	794	2008	735	.93
2006	778	2009	673	.87

Summary of Enrollment Analysis

In preparing the long range enrollment forecast, ten years of historical data, along with birth data, were used in a cohort survival analysis. The formula driven data was then analyzed using trend information from the school division itself, and other sources. Although we see Allegany County's enrollment continuing to decline, it appears that, if all other variables remain the same, the decline will slow down in the later part of the ten year period through 2019. The elementary enrollment will be the first cohort to stabilize at around 3800 students. The enrollments for Allegany High School and Fort Hill High School look as though they will remain above 700 students each.

Capacity and Utilization Analysis

An objective analysis of capacity for all school facilities is crucial to determining the ability of the current structures to handle the school population, and their potential for handling future enrollment and program. This analysis also helps planners and educators to understand which components may be limiting a school's capacity from an operational perspective, so that the future plan can include what, where, when and type of needs for capital improvement planning.

School capacity should be a component of annual data review. Enrollment as a percent of capacity can provide a 'trigger point' for construction planning purposes (i.e. when enrollment exceeds 85% program capacity, additional facility capacity should be initiated or, conversely, when enrollment goes below 65% program capacity, alternative facility options to accommodate programs should be considered).

This capacity analysis includes:

- The definition of 'capacity' specific to Allegany County Public Schools, and definitions for:
    - Design capacity (State of Maryland influence)
    - Functional capacity (Facility use today)
    - Program capacity (Desired facility use – locality influence)
- A capacity analysis of Allegany and Fort Hill High Schools based on enrollments, programs and utilization, and master schedule.
- A capacity analysis of the Center for Career and Technical Education based on enrollments, programs and utilization, and master schedule.
- A capacity analysis of Washington and Braddock Middle Schools based on enrollments, programs and utilization, and master schedule.

This analysis, together with an analysis of the physical structures of each of these Cumberland City Public Schools, provides an overall view of the infrastructure capabilities as they exist today, and an idea of which appears to have the longevity to continue to serve the division into the future.

Definition of 'Capacity' Specific to Allegany County (City of Cumberland) Public Schools

Discussions with school administration and staff at various levels revealed that school capacity in Cumberland could be determined in response to several of the following factors:

- Educational program philosophy (grade level house vs. departmentalized, new offerings, new requirements, specialty programs).
- Change of class size/student to teacher ratios (reductions).
- Expansion of educational services (increased special needs, pull-out programs, etc.).
- Scheduling.
- Adequacy of space for program delivery.

When a change occurs in one of these factors, the capacity of a school needs to be updated. Special needs and implementation of programs for remedial/enrichment efforts affect capacity more than any other factor (e.g. 18:1 vs. 8-10:1 in classrooms).

A critical component of analysis is how a space is actually used and managed. An analysis of how space is managed in Cumberland was accomplished through review of the master schedule (at the high school and middle school levels) and floor plans, identification of current space use and pupil teacher ratios by building principals and confirmation of any questions regarding use by building principals.

Capacity can generally be defined in three basic ways:

- ***Design Capacity*** is the desired maximum capacity at the time of building design, and assumes the maximum number of students per classroom. This formula generally follows either state 'standards' or a modification of this standard by the locality. Design capacity is often recalculated when a facility is renovated or modernized. It is calculated based on space (s.f.) rather than educational program or function; therefore, an 85% efficiency factor is applied to the total to reflect the reality that not every space is used to 100% capacity 100% of the day. This is the number that the State uses for calculating funding requests.

- ***Functional Capacity*** is the capacity of a school as it functions from year to year based on enrollment and programs. For example, in a high growth area, a school may actually have a functional capacity above the design capacity, or if a school has a stagnant or declining population or a large population of students with special needs, a school may have a functional capacity significantly below design capacity.

Functional capacity is most affected by program changes and student course enrollment. A good example in Allegany is the computer labs, which are generally used as open, not scheduled space. It may be fully used 100% of the day on Monday and only 25% of the day on Tuesday.

- ***Program Capacity*** can be considered as a hybrid of design and functional capacity. In calculating program capacity, the maximum number of students per classroom by policy and/or by stated standards is used, but full-sized classrooms that are used to deliver specific programs consistently from year to year are also considered in the formula (such as the example above of the open computer labs). This methodology for calculating capacity works well in school divisions such as Allegany where decline has slowed, and there is little or no consistent enrollment change from year to year. It also allows for a more consistently defined capacity number from year to year unless substantial changes are made to a school's program such as the addition of curriculum, alternative education, learning labs, community use during day hours, and other aspects of the educational programming not mentioned here.

The following chart for each school studied shows the comparison of these three methods of calculating capacity. The State's 'efficiency factor' of 85% was applied to the design capacity calculations. This factor was not applied to the functional or program capacity calculations as these numbers essentially have a built-in efficiency factor due to lower pupil-teacher ratios (PTRs) by course enrollment or locality choice. However, a percentage of the design capacity is shown for each method, for comparison. The functional capacity column indicates enrollment as reflected in the fall, 2009 master schedules for each school. Notes indicate where there is a discrepancy in comparison to other methodologies. The program capacity column reflects the desired local PTR of 18 to 1 for core academic classes (including math, science, English, social studies, and foreign language), 16 to 1 for electives, and 10:1 for special education programs.

Finally, a utilization factor is indicated for each, based on the ratio of calculated capacity to student enrollment as of October, 2009. While the utilization factors appear to be lower in the high schools than enrollment and program may warrant, it is important to note that a variety of program choices in elective courses can lead to less overall utilization of a space specifically designed for that program. Full sized classrooms converted to other program/resource (i.e. Project YES, computer labs, etc.) use also affect the utilization factors. PTRs in core classrooms are, in fact, averaging higher than the desired 18 to 1 ratio; in many cases closer to or above the upward class average or design capacity of 25 to 1.

Allegany High School – Capacity and Utilization Analysis

Instructional Spaces	Design			Functional			Program		
	Classrooms	PTR	Capacity	Classrooms	Avg. PTR	Capacity	Classrooms	PTR	Capacity
Academic Classrooms	32	25:1	800	31	19:1	589	32	18:1	576
Elective Classrooms	8	18:1	144	6	17:1	102	8	16:1	128
Special Education	4	10:1	40	2	8:1	16	5	10:1	50
Arts Education	2	18:1	36	2	18:1	36	2	16:1	32
Music (chorus/band)	2	18:1	36	2	15:1	30	2	16:1	32
PE	2	50:1	100	2	25:1	50	2	25:1	50
Health	2	50:1	100	1	20:1	20	2	25:1	50
Computer Lab Shared use	1	25:1	25				1	16:1	16
Other:				Not on master schedule utilization: Rm 149 - health 3 rooms inclusion/academic village 18 - computer lab 21/27 - CTE labs			Academic village in SE number		
TOTAL			1281						
	Efficiency Factor		85%	Functioning		66%	ACPS Program		73%
Capacity			1089			843			934
Enrollment	Oct. 2009	773		773			773		
Utilization (enrollment:capacity)		71.0%		91.7%			82.8%		

Fort Hill High School – Capacity and Utilization Analysis

Instructional Spaces	Design			Functional			Program		
	Classrooms	PTR	Capacity	Classrooms	Avg. PTR	Capacity	Classrooms	PTR	Capacity
Academic Classrooms	37	25:1	925	34	19:1	646	36	18:1	648
Elective Classrooms	18	18:1	324	14	15:1	238	18	16:1	288
Special Education	1	10:1	10				2	10:1	20
Arts Education	2	18:1	36	2	23:1	46	2	16:1	32
Music (chorus/band)	2	18:1	36	2	18:1	36	2	16:1	32
PE	2	50:1	100	3	20:1	60	3	25:1	75
Health	1	50:1	50	1	20:1	20	2	25:1	50
Computer Lab Shared use	2	25:1	50				2	16:1	32
Other:				Not on master schedule utilization: 221/234 - computer labs 206 - special education 255 - Project YES 261 - Yearbook/darkroom 263 - Newspaper (under 500 s.f.) 120 - science 142A - classroom 113B - health 122 - food lab			Project YES c.f. in SE number		
TOTAL			1531						
	Efficiency Factor		85%	Functioning		68%	ACPS Program		77%
Capacity			1301			1046			1177
Enrollment	Oct. 2009	806			806			806	
Utilization (enrollment:capacity)		61.9%			77.1%			68.5%	

Center for Career and Technical Education – Capacity and Utilization Analysis

Instructional Spaces	Design			Functional			Program		
	Classrooms	PTR	Capacity	Classrooms	Avg. PTR	Capacity	Classrooms	PTR	Capacity
Academic Classrooms	14	25:1	350	14	12:1	168	14	18:1	252
Elective Classrooms	19	18:1	342	18	11:1	198	19	16:1	304
Special Education		10:1		1	5:1	5	1	10:1	10
Arts Education	1	18:1	18	1	11:1	11	1	16:1	16
Music (chorus/band)		n/a			n/a			n/a	
PE		n/a			n/a			n/a	
Health		n/a			n/a			n/a	
Computer Lab Computer literacy	1	25:1	25	1	13:1	13	1	16:1	16
Other:				97 - Print shop - not on master schedule					
TOTAL			735						
	Efficiency Factor		85%	Functioning		54%	ACPS Program		81%
Capacity			625			395			598
Enrollment	Oct. 2009	306			306			306	
Utilization (enrollment:capacity)		49.0%			77.5%			51.2%	

Braddock Middle School – Capacity and Utilization Analysis

Instructional Spaces	Design			Functional			Program		
	Classrooms	PTR	Capacity	Classrooms	Avg. PTR	Capacity	Classrooms	PTR	Capacity
Academic Classrooms	25	25:1	625	24	21:1	504	24	18:1	432
Elective Classrooms	4	18:1	72	4	12:1	48	4	16:1	64
Special Education	1	10:1	10	2	8:1	16	2	10:1	20
Arts Education	2	18:1	36	2	12:1	24	2	16:1	32
Music (chorus/band)	2	18:1	36	2	24:1	48	2	16:1	32
PE	1	50:1	50	1	25:1	25	1	25:1	25
Health	1	25:1	25	1	n/a		1	25:1	25
Computer Lab Shared use	2	25:1	50	2	n/a		1	16:1	16
Other:				130 - SE - reg classroom divided several core rooms 'pull out' - lower PTR Computer lab is shared use - not master scheduled (one addt'l small) PE/Health combined					
TOTAL			904						
	Efficiency Factor		85%	Functioning		74%	ACPS		71%
Capacity			768			665			646
Enrollment	Oct. 2009	616			616			616	
Utilization (enrollment:capacity)		80.2%			92.6%			95.4%	

Washington Middle School – Capacity and Utilization Analysis

Instructional Spaces	Design			Functional			Program		
	Classrooms	PTR	Capacity	Classrooms	Avg. PTR	Capacity	Classrooms	PTR	Capacity
Academic Classrooms	29	25:1	725	29	22:1	638	29	18:1	522
Elective Classrooms	5	18:1	90	5	14:1	70	5	16:1	80
Special Education	2	10:1	20	3	8:1	24	2	10:1	20
Arts Education	2	18:1	36	2	14:1	28	2	16:1	32
Music (chorus/band)	2	18:1	36	2	28:1	56	2	16:1	32
PE	1	50:1	50	1	28:1	28	1	25:1	25
Health	1	25:1	25	1	n/a		1	25:1	25
Computer Lab Shared use	1	25:1	25	1	n/a		1	16:1	16
Other:				PE/Health combined Computer lab is shared use, not master scheduled SE - 2 full, 1 half size classroom					
TOTAL			1007						
	Efficiency Factor		85%	Functioning		84%	ACPS Program		75%
Capacity			856			844			752
Enrollment	Oct. 2009	648		648			648		
Utilization (enrollment:capacity)		75.7%		76.8%			86.2%		

Capacity and Utilization Summary Chart

	Allegany High	Fort Hill High	Center for Career & Tech Ed	Braddock Middle	Washington Middle
Enrollment Oct. 09	773	806	306	616	648
Design Capacity	1060	1270	625	745	830
Design Utilization	73%	64%	49%	83%	78%
Functional Capacity	845	1045	395	665	845
Functional Utilization	92%	77%	78%	93%	77%
Program Capacity	935	1175	600	645	750
Program Utilization	83%	69%	51%	95%	86%
State-Rated Capacity	1060	1115	605	765	819

Resource Committee

The Board of Education and Superintendent of Schools of Allegany County appointed a Resource Committee to work with Eperitus and Allegany Public Schools on the **Utilization Study of Cumberland Secondary Schools.**

The Resource Committee consists of:

- One staff Member from each of the 5 middle/high schools
- One Parent/Community Member from each of the 5 middle/high schools, for a maximum of 6, including:
- 2 to 3 members with children currently enrolled in each of the 5 school
- 2 to 3 members with children currently enrolled in a feeder elementary school (Parkside, John Humbird, South Penn, Bel Air, Cash Valley Cresaptown, Flintstone, Northeast, West Side)
- Two current high school students (1 each from Allegany and Fort Hill)
- Two Community/Business representatives (1 each residing in the Allegany and Fort Hill attendance areas)
- Superintendent and Senior Staff, and representatives from County government to serve as ex officio, non-voting members to support the work of the committee (the Internal Resource Committee)

The Resource Committee is charged with:

- Attending all work sessions facilitated by Eperitus in which they will establish evaluation criteria through indicators of quality, review pertinent data, and explore implications of options.
- Evaluating options using parameters based on the Project Goals set forth by the Allegany Board of Education.
- Providing recommendations to the Superintendent and Board of Education regarding long-range capital improvement priorities for the secondary schools in the City of Cumberland. This includes: Allegany High School, Fort Hill High School, Braddock Middle School, Washington Middle School, and the Center for Career and Technical Education
- Evaluating how well each building within each option accommodates the educational programs and services based upon the projected enrollment for 2015.
- Evaluating how well each option in totality accommodates the educational program and services based upon the projected enrollment for 2015.

- Seeking all information necessary to make informed decisions, and providing the above recommendations with community consensus on most appropriate approach.
- Communicating the recommendations to Board of Education and community.

Resource Committee Meeting Summaries

All Community Resource Committee Meetings were recorded and broadcast via the ACPS website. The following information includes meeting agendas and primary working documents.

Resource Committee Introductory Meeting
12/7/2009
AGENDA

I.	Welcome and Introductions	Dr. Cox
II.	Review of Charge	Dr. Cox
III.	Project Organizational Tasks	Joanne Huebner
IV.	Meeting Process – Intro of Resources	Joanne Huebner
V.	Enrollment Projection/Capacity/Utilization – Data Process and Use	Carl Chafin
VI.	Indicators of Quality – Things to Consider	Joanne Huebner
VII.	Q & A	Resource Committee Members
VIII.	Next Steps and Communication Structure	Joanne Huebner

NOTES
Sharepoint site: http://sharepoint.eperitus.com/acpsresource

Working Document #1 - Indicators of Quality Worksheet
The Internal Resource Team provided some input to start the Indicators of Quality (IOQ) documentation process at our organizational meeting. Please review the charts, noting your comments or questions. Then, list the indicators of quality in each of the categories as they relate to this Cumberland Secondary Schools study and your area of representation. Note WHY you feel the indicator is important to this process. Also indicate those that you feel should be top priority. If you feel there is a general category that is missing, please add it. We will discuss these as a group.

Enrollment / Capacity and Utilization

IOQ	Why Indicator Selected	Priority
Goal – 85% Utilization	State Funding Above – no where to move or expand program Below – not good use of space	

Educational Program Adequacy

IOQ	Why Indicator Selected	Priority
Program Adjacency	Delivery – distance during transitions, Program relationships (future) (Matrix as part of Ed Spec)	
Technology Infrastructure	Integration / power / accessibility w/ curriculum	
Experience–based curriculum	Space to learn and do	
Availability of higher level courses		
Intramural programs	Recreational league not offered as much, better choice	

Building Condition

IOQ	Why Indicator Selected	Priority
Flexible Space	Changing program and unpredictability, Integrated programs	
Central Climate Control	Student comfort – year- round, Standard for new schools	
Green	Energy Efficiency, Silver LEEDS	
Safety / Security	Intruders, ability to separate school program from outside, confined community access	
ADA	Law	
Technology	Power / Infrastructure to support wireless	
21st Century Spaces	Changes?	
"WOW" Factor	Feeling of being there / experience	
Day lighting	Health / Student Learning	
Cafeteria / Foodservice	Opportunities to find cost/space savings	

Fiscal Responsibility

IOQ	Why Indicator Selected	Priority
Maximum chance for funding by state	Affordability	
Local Funding Support	Make sense to people providing the $ (distribution)(controlling) * above and beyond	

Community Use and Acceptance

IOQ	Why Indicator Selected	Priority
All facilities "open" to community education programs (after school hours)	Use of fiscal resources , potential revenue source, partnerships – means to develop stronger relationships	

Data Presentation and Development of Indicators of Quality
January 25, 2010
AGENDA

I. Welcome / Business — Joanne Huebner
   - Schedule of Meetings
   - Agenda Review
   - Other Business

II. Presentation of Data (Draft Report on Portal) — Carl Chafin / Joanne Huebner
   - Summary of Building Condition
   - Enrollment Projections
   - Capacity & Utilization

III. Indicators of Quality Break Out Session (attached) — Joanne Huebner / CRC

IV. Group Reports and Discussion — CRC

V. Wrap Up / Adjourn — Joanne Huebner

Next Meetings:
Monday, February 9 – 6:30 – 8:30 – Maryland Panel Discussion/Option Development
Monday, February 22 – 6:30 – 8:30 – Option Analysis
Monday, March 15 – 6:30 – 8:30 – Option Refinement and Draft Recommendation(s)

Working Document #2 – Indicators of Quality Worksheet
The Community Resource Committee has been charged with establishing evaluation criteria through indicators of quality, reviewing pertinent data, and exploring implications of options. The Indicators of Quality (IOQ) established at our January 25 meeting will provide the framework and priorities on which to evaluate the facility options you develop.

Therefore, IOQs should be:
- Meaningful to Allegany / Cumberland
- Practical / feasible
- Measurable / evidence-based / data-driven
- Sustainable

Indicators of Quality Categories and BOE Evaluation Parameters:
Enrollment / Capacity and Utilization
Accommodating current and future educational programs and services based upon the projected enrollment for 2015

Building Condition
Maintaining safe and healthy schools, which enrich the educational experience for all students

Fiscal Responsibility
Providing current and future programs and services in the most cost efficient and effective manner, maximizing state funding opportunities

Community Use and Acceptance
Maximizing the utilization of school facilities which includes the regular school day use, after-hours use and community use

Educational Program Adequacy
Providing equitable educational course offerings and experiences, both curricula and extra-curricular, for all middle school and high school students in their respective schools

Indicators of Quality Worksheet Assignment
The Internal Resource Team provided some input to start the Indicators of Quality (IOQ) documentation and discussion process at our organizational meeting. These may or may not ultimately be part of the IOQs you establish, but are provided for your consideration.

The CRC assignment is to review the charts, noting your comments or questions. Then, list **one or two** indicators of quality in each of the categories as they relate to this Cumberland Secondary Schools study and your area of representation. Note WHY you feel the indicator is important to this process. Also indicate those that you feel should be top priority. Keep in mind the Evaluation Parameters provided to you by the Board of Education at the initial meeting (shown above and divided into chart categories). If you feel there is a general category that is missing, please add it.

We will discuss these as a group, and create a document that we will use in option evaluation.

State of Maryland Panel Discussion / Option Development
February 8, 2010
AGENDA

I. Call to Order — Kimi-Scott McGreevy, Chair
   a. Agenda Review
   b. Other Business
II. Presentation by Guest Speakers
   State of Maryland, Interagency Committee on School Construction — Dr. David Lever
   Allegany/Cumberland, Deputy Director of Public Works — Mr. Paul Kahl
III. Q&A
IV. Indicators of Quality Wrap Up (see portal) — Joanne Huebner / CRC
V. Breakout Discussion – Options for Consideration — CRC
VI. Wrap Up – Work Plan — Joanne Huebner
VII. Adjourn — Kimi-Scott McGreevy, Chair

Next Meetings:
Monday, February 22 – 6:30 – 8:30 – Option Analysis
Monday, March 15 – 6:30 – 8:30 – Option Refinement and Draft Recommendation(s)

Working Document #3 - Project Goals:

- Accommodating current and future educational programs and services based upon the projected enrollment for 2015
- Maintaining safe and healthy schools, which enrich the educational experience for all students
- Providing current and future programs and services in the most cost efficient and effective manner, maximizing state funding opportunities
- Maximizing the utilization of school facilities which includes the regular school day use, after-hours use and community use
- Providing equitable educational course offerings and experiences, both curricula and extra-curricular, for all middle school and high school students in their respective schools

Working Document #4 - CRC Charge:

- Attending all work sessions facilitated by Eperitus in which they will establish evaluation criteria through indicators of quality, review pertinent data, and explore implications of options.
- Evaluating options using parameters based on the Project Goals set forth by the Allegany Board of Education.

- Providing recommendations to the Superintendent and Board of Education regarding long-range capital improvement priorities for the secondary schools in the City of Cumberland. This includes: Allegany High School, Fort Hill High School, Braddock Middle School, Washington Middle School, and the Career Technical High School.
- Evaluating how well each building within each option accommodates the educational programs and services based upon the projected enrollment for 2015.
- Evaluating how well each option in totality accommodates the educational program and services based upon the projected enrollment for 2015.
- Seeking all information necessary to make informed decisions, and providing the above recommendations with community consensus on most appropriate approach.
- Communicating the recommendations to Board of Education and community.

Option Analysis
February 22, 2010
AGENDA

I.	Call to Order Agenda Review Other Business	Kimi-Scott McGreevy, Chair
II.	Group Briefing/Thoughts	Team Reporters
III.	Indicators of Quality Priorities	Joanne Huebner / CRC
IV.	Breakout Discussion – Options for Consideration	CRC
V.	Wrap Up – Work Plan	Joanne Huebner
VI.	Adjourn	Kimi-Scott McGreevy, Chair

Next Meeting:
Monday, March 15 – 6:30 – 8:30 – Option Refinement and Draft Recommendation(s)

Working Document #5 - Breakout Group Process
Facilitator – makes sure discussion stays on track and all are heard
Time Keeper – reminds group of schedule
Recorder – writes key discussions for sharing
Reporter – summarizes discussion for whole group
Rules for Discussion
1. Allow speaker to finish through without interruption
2. Look at pros and cons of each issue
3. Refrain from sidebar conversations – listen
4. Goal – reach consensus / agreement (note minority reports)
5. Ask questions – seek first to understand

Working Document # 6 - Indicators of Quality – Group Top Issues

Community Use	Safety	1 vote
Financial Responsibility	**State funding**	**4 votes**
	Equity/Serve entire community	**4 votes**
	Student needs – Workforce	**4 votes**
Building Condition	Floor Plan/Flow	1 vote
	Accessibility (ADA)	2 votes
	21st Century/Future focus	**6 votes**
	Cost	1 votes
Educational Adequacy	**Experience-based spaces**	**4 votes**
Enrollment/Capacity/Utilization	Student-teacher ratios	3 votes
	Appropriate for use	1 vote
	Student support	1 vote

Working Document # 7 - Group Discussion Summary

Group 1

Daniel Nelson, Mike Calhoun, Jeff Blank, Randy Bittinger, Kimi-Scott McGreevy

Add to Fort Hill to accommodate Allegany's population

Pluses	Minuses
Stadium	1500 seat school
2600 seat auditorium	Concerned about academic achievement of low income students
2346 gym	No school of that size in area – closest
Frederick	
Broad array of courses	Allegany empty

One middle school built new for both districts

Pluses	Minuses
We have land	Access roads
Maintenance staffing	Population very large – affect low income students
Creative academic opportunities	Expansive site preparation

Include Career Center in new high school – 1800 seat school

Renovate middle schools first

Pluses	*Minuses*
Improve delivery of academic programs (current buildings don't allow	not new buildings
No split schedule if put career programs in Fort Hill/Allegany	

Put Career Center academic classes and some programs at Allegany and Fort Hill and Mountain Ridge

Pluses	*Minuses*
Place to put middle school students during renovation	Allegany put off
Saving on staffing costs	Transportation
Eventually 108 Washington St. could locate there	
Allows enrollment projections for high schools to be validated and a decision made accordingly	

Group 2
Vince Montana, Sonya Eisentrout, Bo Evans (Carter), Tessa Fairall, Deborah Bittinger, Kathryn Huber

1st phase – renovate both middle schools
2nd phase – address high schools

1 campus (1 Cumberland) – 1 HS, 1 MS, 1 Tech

Within 1 facility include tech training (in Cumberland)

Renovate Braddock Middle to high school and Allegany renovate to be a middle school (land available to expand)

Need new high school over middle school

Build a technical high school, grades 9-12, all amenities of comprehensive high school

Group 3
Paul Kahl, Janel Shoemaker, Steve Lewis, Jaynea Lechliter, Janet Wilson

Phase I – Middle School Options
Cost of renovation vs building new on current sites for both schools
    Could answer and be associated with all high school options below

One middle school – new large at Braddock site (contingency – if one middle school, 1 high school)
    Connected to renovate Fort Hill or build a new high school option

Phase II – High School Options
Construction of a new Allegany (Fort Hill remains) AND
Renovate Fort Hill to include CCTE

Renovate Fort Hill or build a new high school for both high school populations

Think about:
Make Fort Hill Washington Middle
Build a new Braddock
Build a new high school with consideration for including the Career Center (1 HS)

Working Document #8 - Questions/Comments/Additional Data Requests
Tour of schools – combination of video and visit / calendar of times and dates to be coordinated through Central Office
Formulas for new and remodels
    Pro-rated systems –
    Schools 40 yrs or older = new school cost – Washington and Braddock
    Allegany – 1982
    Fort Hill – 1992
    CTC – 1969 / C wing 1996 / 1974
Estimated costs for options
    Local costs if added to Fort Hill for Allegany
    Local and state cost splits
    Analysis of new vs. renovation costs for middle schools
Building the case – (noted that state favors fix it first)
Phasing? Priorities? Long Range Plans

Size of school – meeting all students' needs? Is it a plus or minus? Amenities?
Feasibility of using existing sites while building new
Available sites – hospital?

Option Refinement and Recommendations
March 15, 2010
AGENDA

I.	Call to Order	Kimi-Scott McGreevy, Chair
	Agenda Review	
	Other Business	
II.	Additional Data Reports	
	School Tours – Insights	CRC members
	School Sites	Paul Kahl
	School Size & Educational Models	Joanne Huebner
	Cost Comparisons	Carl Chafin
III.	Option Review	Joanne Huebner
IV.	Option IOQ Analysis	CRC Breakout Groups
V.	Group Reports and Discussion/Option Narrowing	CRC
VI.	Wrap Up – Work Plan	Joanne Huebner
VII.	Adjourn	Kimi-Scott McGreevy, Chair

Next Meeting:
Monday, March 22 – 6:30 – 8:30 – Option Refinement and Draft Recommendation(s)

Option Refinement
March 22, 2010
AGENDA

I.	Call to Order	Kimi-Scott McGreevy, Chair
II.	Agenda Review / Meeting Goal	Joanne Huebner / Dr. Cox
III.	Analysis and Breakdown of Options/Individual Feedback	Carl Chafin
IV.	Options for Further Analysis	CRC
V.	Option Implication/IOQ Analysis	CRC
VI.	Draft Recommendations for Public Input Session (if ready)	CRC
VII.	Public Input Process/CRC Role	Dr. Cox / Kimi-Scott McGreevy
VIII.	Adjourn	Kimi-Scott McGreevy, Chair

Option Summary
Working Document #9

Option U Renovation/Addition to Fort Hill Facility for Cumberland High School 1500 Students Include Career Center in HS 1800 Students or Renovate CCTE 300 Students New Cumberland Middle School 1250 Students	Option U(a) Renovation/Addition to Fort Hill Facility for Cumberland High School 1500 Students Include Career Center in HS 1800 Students or Renovate CCTE 300 Students Renovate Braddock Middle School 625 Students Renovate Washington Middle School 625 Students
Option V New Cumberland High School 1500 Students Include Career Center in High School Or Create a 'Technical High School' 1800 students New Cumberland Middle School 1250 Students	Option V(a) New Cumberland High School 1500 Students Include Career Center in High School Or Create a 'Technical High School' 1800 students Renovate Braddock Middle School 625 Students Renovate Washington Middle School 625 Students

Option W Cumberland Educational Campus New Cumberland High School 1500 Students New Career Center 300 Students New Cumberland Middle School 1250 Students	
Option X Renovate Braddock as a High School 750 Students Renovate Fort Hill High School 750 Students Renovate CCTE 300 Students Renovate Allegany as a Middle School 625 Students Renovate Washington Middle School 625 Students	Option X(a) Renovate Braddock as a High School to include some CCTE 850 Students Renovate Fort Hill High School to include some CCTE 850 Students Renovate Allegany as a Middle School 625 Students Renovate Washington Middle School 625 Students *Assumes Mountain Ridge would also have some CCTE (100 students)

Option Y	Option Y(a)
New Allegany High School 750 Students Renovate Fort Hill High School 750 Students Include CCTE in Fort Hill Renovation 1050 Students or Renovate CCTE 300 Students Renovate Braddock Middle School 625 Students Renovate Washington Middle School 625 Students	New Allegany High School to include some CCTE 850 Students Renovate Fort Hill High School to include some CCTE 850 Students Renovate Braddock Middle School 625 Students Renovate Washington Middle School 625 Students *Assumes Mountain Ridge would also have some CCTE (100 students)
Option Z	Option Z(a)
Renovate Allegany High School 750 Students Renovate Fort Hill High School 750 Students Renovate CCTE 300 Students New Braddock Middle School 625 Students New Washington Middle School 625 Students	Renovate Allegany High School to include some CCTE 850 Students Renovate Fort Hill High School to include some CCTE 850 Students New Braddock Middle School 625 Students New Washington Middle School 625 Students *Assumes Mountain Ridge would also have some CCTE (100 students)

Working Document #10 - Option Ranking Format

Great work on Monday! We would like to know your opinion on the following options produced at Monday's meeting. Please rank these options from 1 to 9 in the left hand column. 1 is the most favorable option, 9 the least favorable. Consider all discussions to date as they relate to community use, fiscal responsibility, utilization for enrollment, building condition and educational adequacy as you rank.

RANK		Middle Schools		High Schools		CCTE	
		Renovate	New	Renovate	New	Renovate	New
51	U		combined	combined at FH		X	
42	Ua	(2)		combined at FH		X	
52	W – new campus		combined		combined		X
33	Revised X		WMS BMS at AHS	FHHS	AHS at BMS	X	
28	Y	(2)		FHHS	AHS	X	
30	Z		(2)	(2)		X	
47	Hybrid 1	combined at FH			combined	X as 9-12	
26	Hybrid 2 – M/H campus	BMS	WMS	FHHS	AHS	X	
42	Hybrid 3	(2?)	(2?)	wait	wait	wait	wait

Option Evaluation

One High School Option Evaluation

Building Condition

- Remodeling of Fort Hill facility and site to satisfy educational program for 1500, parking, recreation, athletic fields, access may be a challenge.

- Community Acceptance
  - Sense of identity and history / tradition potentially compromised.
  - Opportunity to bring community together (i.e. create new identity with new name, mascot, etc.).
  - May trigger the need to reconfigure attendance boundaries.
  - Long-range CIP has included new facilities – community is counting on them being delivered as promised.
  - Reduces facility space for community events (gym, auditorium, etc.).

- Educational Adequacy
  - Impact of 1500 students on safety (i.e. lunch shifts, emergency evacuations, violence, vandalism, etc.).
  - Competitive course offerings may be enhanced
  - Potential for meeting individual needs through greater staff utilization and flex grouping opportunities.
  - Less opportunity for participation in a variety of extra-curricular offerings at the same level as middle school; reduces opportunity for individual student recognition in these activities.
  - Studies indicate smaller is more conducive to productive learning.

- Fiscal Responsibility
  - Potential for reduction in force leading to reduction in costs.
  - Operational and administrative costs should be lower.
  - Higher cost for renovation for the locality (less participation from state).
  - Almost all sports teams would need to travel to compete – higher transportation costs.

- Utilization for Enrollment
  - Reduces opportunity to accommodate growth.
  - Disparity in student populations between county high schools.
  - Class sizes may increase.

Two High School Option Evaluation

- Building Condition
  - Sites for new facilities are yet to be determined.

- Community Acceptance
  - Two high school tradition is source of community pride.
  - Supports state goals of preservation of community identity and focal points in community.
  - Local businesses supply both programs and benefit economically from school events.

- Educational Adequacy
  - School size is what is valued in Allegany County – provides stronger connections between students and adults.
  - Student-teacher ratios proven to be conducive to effective learning.
  - Continues current student success.
  - Allows same participation in extracurricular activities as current.
  - May result in schedule conflicts regarding course offerings.
  - Studies indicate smaller is more conducive to productive learning.

- Fiscal Responsibility
  - Better opportunity for more state funding in three schools because of age and last CIP.
  - Poised for strong proposal to state in terms of values.
  - Current facilities can be used during construction to avoid disruption of renovations.
  - Some duplication of services.

- Utilization for Enrollment
  - Stable enrollment trends over 10 years.

Community Input

A community input session was held on April 19, 2010. The community was also encouraged to provide input via e-mail to the Allegany County Public Schools and through direct communication with Committee members. The following summary was prepared for the committee to review:

Central themes pulled from community emails and community input session. These focus not on the position, but on the reasons/interests for the position.

Two High School Option

- Research show smaller schools are better for effective learning
- Academically competitive – i.e. more opportunity for AP Classes
- Greater opportunity to participate in sports – healthy competition
- More extra-curricular opportunities
- Students are engaged
- Faculty knows students – relationships to help students succeed
- Numbers are stable and expected to remain that way
- Allegany HS facility overdue for renovation/replacement
- 3 schools of similar size – healthy and full of opportunities because of size
- Mutual feeling of belonging and community – engaged in community
- Current HS system makes Cumberland special – unique qualities that make each school special in own right
- Integrity of traditions
- Positive potential on economic development

One High School Option

- Fiscally responsible
- Greater academic diversity
- More opportunity for extra-curricular activities
- Defies current educational trends
- "fair" in terms of previous consolidations

Other Comments and Observations:

- Review all plans with an emphasis on attendance boundaries - better allocation of students for diversity
- Parity in system
- Middle schools in need of renovation as well – been a constant in the CIP/all eggs seem to be in AHS basket – model responsible stewardship
- Board of Education Master Plan goals
- People and voters (and students) outside of the city limits

FINAL RECOMMENDATION TO THE BOARD OF EDUCATION

At the final meeting on April 26, 2010 the committee discussed the recommendations that were submitted in the memo below to the Allegany County Board of Education on May 11, 2010.

MEMO

To: Allegany County Board of Education
From: Community Resource Committee
Re: Utilization Study of Cumberland Secondary Schools Recommendations
Date: May 6, 2010

The primary charge of the Community Resource Committee consisted of "Providing recommendations to the Superintendent and Board of Education regarding long-range capital improvement priorities for the secondary schools in the City of Cumberland. This includes: Allegany High School, Fort Hill High School, Braddock Middle School, Washington Middle School, and the Career Technical High School."

The committee met eleven times from November, 2009 through April, 2010 including one meeting to gather public comment. The committee reviewed and discussed data relative to school capacity & enrollment, building condition, policies and practices, funding at state and local levels, and research studies. A number of the committee members toured each of the five schools. The committee also developed and discussed nearly 20 different options relative to the five schools included in their charge.

At its meeting on April 26, 2010 the Committee decided to move forward with the following recommendations to the Allegany County Superintendent and Board of Education:

RECOMMENDATION 1: NUMBER OF SCHOOLS

With respect to the *number of secondary schools in Cumberland* the Committee recommends that Allegany County:

- Continue to operate two middle schools, Braddock and Washington.

- Continue to operate two high schools, Allegany and Fort Hill (Five of the eight voting members of the Committee were in support of this recommendation, two were undecided and one was opposed).

- Continue to operate the Career Technical High School as an option for high school students throughout Allegany County.

RECOMMENDATION 2: PRIORITY

With respect to the *priorities for capital improvements* the Committee strongly believes that all five schools studied have immediate capital improvement needs and that the Board of Education should address these needs as quickly as possible. If funding is not available to address all of the needs simultaneously then the following sequence is recommended:

- Allegany High School and Washington Middle School should be the highest priority to receive the needed capital improvements, either complete renovations or new facilities.

- Braddock Middle School should be the second highest priority to receive the needed capital improvements, either complete renovation or new facility.

- Career Technical High School should be the third priority to receive the needed capital improvements in the form of a renovation.

- Fort Hill High School should be the fourth priority to receive the needed capital improvements in the form of a renovation.

RECOMMENDATION 3: FUNDING

With respect to the *funding for capital improvements* the Committee recommends that Allegany County:

- Develop and implement a capital improvement plan that includes strategies for addressing the needs at each of these five secondary schools that will maximize the amount of state school construction funding that would available for these projects.

- Creatively pursue alternative and innovative funding sources, both locally and at the state and national levels for both planning and construction for these projects to include potential funds available for "green" buildings, historic renovation, and innovative programs that would allow the County to address the pressing needs at these schools sooner.

RECOMMENDATION 4: LOGISTICS

With respect to the *logistics related to construction* at each of the schools the Committee recommends that Allegany County:

- Develop an implementation plan for each project that ensures the safety and security of all students and adults during the construction process.

- Pursue creative strategies for housing students during the construction process that minimizes disruption to the educational program, to students and their families, to the community and to daily activities at the school, to include the possible use on a temporary basis of strategically located nonschool facilities that may be available at the time of construction. In particular the Committee discourages the use of the "split shift" strategy that has been used in the past.

RECOMMENDATION 5: RENOVATE VERSUS BUILD NEW

With respect to *renovation of an existing school versus building a new school* the Committee recommends that Allegany County:

- Determine as quickly as possible the cost and feasibility comparisons for renovating versus build new at Allegany High School, Washington Middle School, and Braddock Middle School to determine the best solution for each school. For Allegany High School in particular resolving this issue is critical in that the Committee recognizes, that relative to renovation, there are significant issues with the age and condition of the building and the site itself, but there is also support for renovation from some in the community given the historic value of the building.

The Committee wishes to thank the Board of Education for the opportunity to be involved in developing this set of recommendations that will hopefully set in motion the development and implementation of a thoughtful, creative, and timely capital improvement plan that will address the critical and longstanding needs of the five secondary schools that serve the Cumberland community. These five schools are currently providing strong educational programs to the community. In is our hope that in the near future these schools and their programs will be housed in facilities that are of the same high quality.

APPENDIX

Internal Resource Committee

Mr. Vince Montana, Director of Facilities
Dr. David Cox, Superintendent of Schools
Mrs. Janet Wilson, Assistant Superintendent of Instruction
Mr. Jeff Blank, Director of Human Resources
Mr. Randy Bittinger, Director of Finance
Mr. Jay Walbert, Director of Transportation
Mrs. Nil Grove, Director of IT
Mr. Mike Calhoun, Allegany High principal
Mr. Steve Lewis, Fort Hill High principal
Mrs. Deborah Bittinger, Career Center principal
Mr. Danny Carter, Braddock Middle principal
Ms. Kim Green, Washington Middle principal

Internal Resource Team Responsibilities

- Understand all important project issues
- Serve as ex officio, non-voting members to support the work of the Resource Committee
- Provide requested information regarding current program and/or ongoing efforts of the school division to the consultant team
- Make appropriate decisions to keep the project on track in best interest of the school division
- Give final approval at each stage of project development

Community Resource Committee

Sonya Eisentrout, parent
Tessa Fairall, parent/teacher JHES
Chad Graham, student CTHS
Kathryn Huber, student FHHS
Sara Beth James, community/business rep
Jaynea Lechliter, parent
Matt Logsdon, parent
Jim "Snake" Robertson, community/business rep
Kimi-Scott McGreevy, parent
Janel Shoemaker, parent/teacher SPES
Leah Wormack, student AHS

Consultant Resource Team

Eperitus – Educational Planning / Instructional Technology Planning
- Mrs. Joanne Huebner, Project Coordinator/Educational Adequacy
- Dr. Carl Chafin, Facility Adequacy and Data Analysis
- Dr. Chuck Swaim, Instructional Technology
- Mrs. Susan Kooch, GIS and Data Analysis

SHW Group – Architects
- Mr. Gary Watson, AIA
- Mr. Derk Jeffrey, AIA

Hurd & Obenchain – Mechanical/Electrical/Plumbing Engineers
- Mr. Benjie Linkous, PE
- Mr. David Roller, PE
- Mr. Harvey Nichols, PE

Daniels & Associates – Structural Engineers
- Ms. Janet Daniels, PE

American Energy Services, LLC – Energy Management
- Mr. Bob Randall

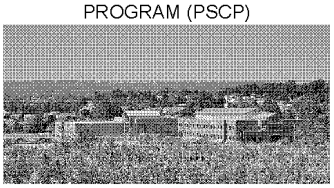
Wired by Design – Communications / Technology
- Bill Comer, RCDD

<u>Consultant Resource Team Responsibilities</u>

- Analysis of current and projected enrollments
- Assessment of the physical condition of facilities
- Assessment of the educational adequacy of facilities
- Development of potential options for future capital projects
- Facilitation of Community Resource Committee process
- Recommendations and associated costs for future capital projects

State of Maryland Cost Model Presentation

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)



Mountain Ridge High School, Allegany County

Community Resource Committee
Allegany County, Maryland
February 18, 2010

David Lever
Executive Director, Public School Construction Program

1

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)

- Established by the State Legislature in 1971 to ensure equity in the condition of schools
- Provided for a program of state funding for school construction under certain conditions
- Under the authority of the Maryland Board of Public Works (BPW)

2

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)

- The PSCP is administered by the Interagency Committee on School Construction (IAC)
- Chairperson: State Superintendent of Schools
- Members:
  - Secretary of the Maryland Department of Planning
  - Secretary of the Department of General Services
  - Two members appointed by the State Legislature

3

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)

School Construction Projects
Types of Projects

New Construction (New, Replacement, Addition)
Renovation and Limited Renovation
Systemic Renovation (building systems and components: boiler, chiller, roof, etc.)
State-owned relocatable classrooms

4

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)

Capital Improvement Program (CIP):

- Submitted to the IAC annually by the Local Education Agency (LEA) (1st submission – October; amendments - early December)
- LEA lists projects in priority order as:
  - Requests for planning
  - Requests for funding

5

STATE OF MARYLAND
PUBLIC SCHOOL CONSTRUCTION
PROGRAM (PSCP)

Review process

- Reviewed by IAC staff (October – April)
- Staff recommendations to the IAC for approval (December, February, April)
- IAC recommendation to BPW for approval (December, April)

6

STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Project Planning

- Program Location
- Programming:
  - Educational specifications (required)
  - Feasibility study to explore options (not required)
- Scope decision (renovation, limited renovation, addition, replacement)
- Project Budget
- Project Schedule

7

STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

State Rated Capacity - Secondary Schools (SRC)

Number of classrooms x 25 students
Multiply by 85% utilization factor
Number of special education classrooms x 10 students
Add the products

Note: *For secondary schools, all instructional areas are counted as classrooms, including gymnasium*

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Example:

40 classrooms x 25 students = 1000
1000 x .85 = 850

2 Special Ed. Classrooms x 10 students = 20

850 + 20 = 870 State Rated Capacity

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

State-Local Cost Share Percentage

Percentage is recalculated every 3 years by the IAC

- Each LEA's percentage is based on local wealth, local funding effort, enrollment growth, FRPM population, and county's One Maryland status. Percentages currently range from 50% to 94%.
- The percentage applies only to eligible construction items

The current state share of construction funding for eligible costs for Allegany County is 91%

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Maximum State Construction Allocation

Based on:

- Maximum gross area allowance: The product of the projected number of students and the gross area allowance per student
- Average statewide construction cost ($ / sf)
- State-local cost share percentage
- An allowance for site development calculated as a percentage of the building cost (12% for new, 5% for renovation
- A contingency for unforeseen conditions etc., calculated as a percentage of the building + site costs (2.5%)
- Previously approved funding at the same school

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Gross Area Allowance Calculation - Example

505 middle school students x 145 sq. ft. =
73,225 gross sq. ft.
10 special education students x 180 sq. ft. =
1,800 gross sq. ft.

Total: 75,025 sq. ft.

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Square Foot Allocations

Elementary Schools		Middle Schools	
Up to 350 Students	131 sf	Up to 600	145 sf
351 to 399	47,080 sf	601 to 649	87,615 sf
400 to 500	118 sf	650 to 800	135 sf
501 to 549	59,290 sf	801 to 849	110,370 sf
550 to 720	108 sf	850 and up	130 sf
721 to 749	77,900 sf		
750 and up	104 sf		
Senior High Schools		**Other** (under development)	
Up to 650	170 sf	Career Tech in HS	210 sf
651 to 700	111,840 sf	CTE Center - Separate	240 sf max
700 to 1,150	160 sf	Spec. Ed – ES / MS	180 sf
1,151 to 1,249	187,390 sf	Spec. Ed – HS	200 sf
1,250 to 1,600	150 sf	Spec. Ed – Separate	300 sf max
1,601 to 1,670	242,150 sf	Alternative Ed	225 sf max
1,671 and up	145 sf	Fine Arts High	300 sf max

STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Renovations:

Allocations are based on the age of the facility and the average statewide construction cost

Percentages of statewide per sq. ft. building cost:

40 years or older – 100%
31 to 39 years – 85%
26 to 30 years – 75%
21 to 25 years – 65%
16 to 20 years – 50%
0 to 15 years – 0%

14

STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Example:

The average statewide construction cost for FY 2011 is $200 / sq. ft. (building only)

An area 40 years old is eligible for $200 / sq. ft. (before application of the state cost share)

An area 35 years old is eligible for 85% of $200 or $170 / sq. ft.
An area 27 years old is eligible for 75% of $200 or $150 / sq. ft.
An area 22 years old is eligible for 65% of $200 or $130 / sq. ft.

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

Example calculations:

Renovation of Bay Shore Middle School

Total existing sq. ft.: 99,000
Projected enrollment: 515 (505 regular, 10 s.e.)

State scope: 505 students x 145 sq. ft.
+ 10 s.e. students x 180 sq. ft. = 75,025 sq. ft.

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STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

State Scope

Construction
75,025 x $200 = $15,005,000 x .91 = $13,654,550
Site
$13, 654,550 x .05 = $682,728
Contingency
$3,654,550 + $682,728 = $14,337,278 x .025 = $358,432
Total $14,696,000 (rounded)

Note: Projects funded in previous 15 years will reduce State total (but should also reduce total construction cost)
Example, Mt. Airy MS in Carroll County: $792,578 funded for 6 projects in previous 15 years

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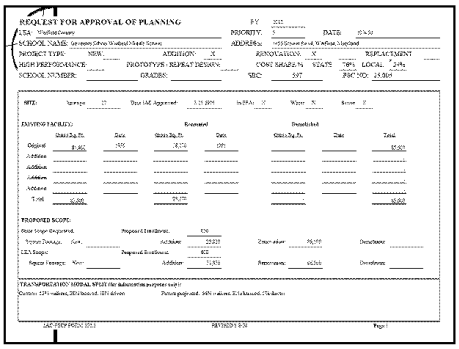
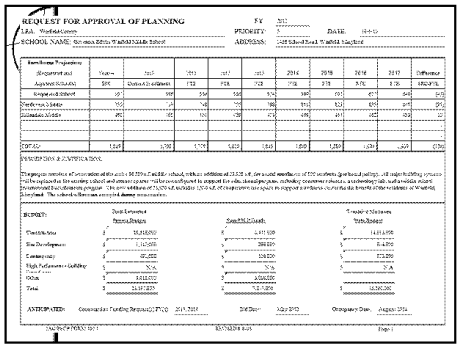

REQUEST FOR APPROVAL OF PLANNING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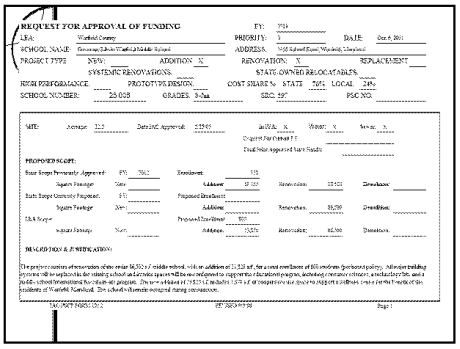
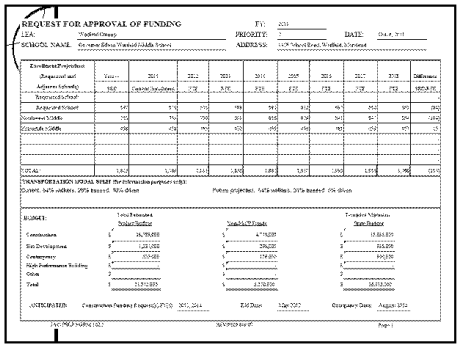
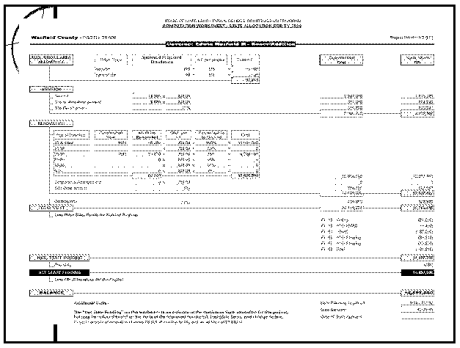
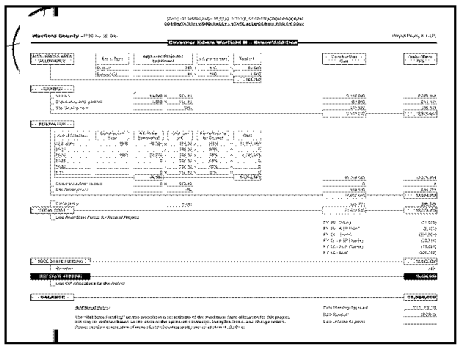
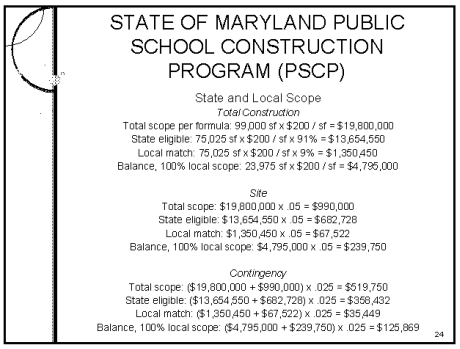

REQUEST FOR APPROVAL OF FUNDING


REQUEST FOR APPROVAL OF FUNDING






STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)

State and Local Scope

Total Construction

Total scope per formula: 99,000 sf x $200 / sf = $19,800,000
State eligible: 75,025 sf x $200 / sf x 91% = $13,654,550
Local match: 75,025 sf x $200 / sf x 9% = $1,350,450
Balance, 100% local scope: 23,975 sf x $200 / sf = $4,795,000

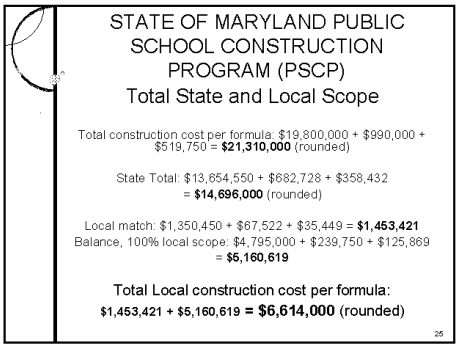
Site

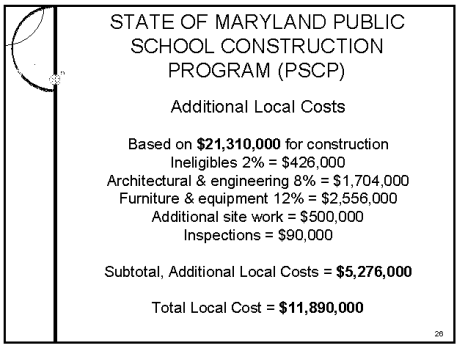
Total scope: $19,800,000 x .05 = $990,000
State eligible: $13,654,550 x .05 = $682,728
Local match: $1,350,450 x .05 = $67,522
Balance, 100% local scope: $4,795,000 x .05 = $239,750

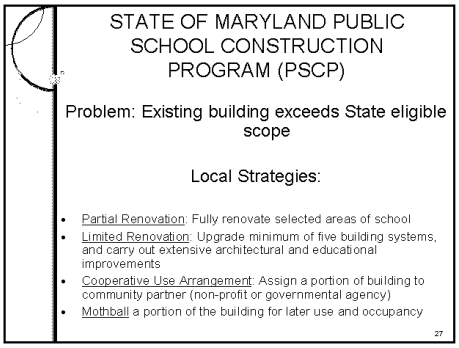
Contingency

Total scope: ($19,800,000 + $990,000) x .025 = $519,750
State eligible: ($13,654,550 + $682,728) x .025 = $368,432
Local match: ($1,350,450 + $67,522) x .025 = $35,449
Balance, 100% local scope: ($4,795,000 + $239,750) x .025 = $125,869

24


STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)
Total State and Local Scope
Total construction cost per formula: $19,800,000 + $990,000 + $519,750 = $21,310,000 (rounded)
State Total: $13,654,550 + $682,728 + $358,432 = $14,696,000 (rounded)
Local match: $1,350,450 + $67,522 + $35,449 = $1,453,421
Balance, 100% local scope: $4,795,000 + $239,750 + $125,869 = $5,160,619
Total Local construction cost per formula:
$1,453,421 + $5,160,619 = $6,614,000 (rounded)
25


STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)
Additional Local Costs
Based on $21,310,000 for construction
Ineligibles 2% = $426,000
Architectural & engineering 8% = $1,704,000
Furniture & equipment 12% = $2,556,000
Additional site work = $500,000
Inspections = $90,000
Subtotal, Additional Local Costs = $5,276,000
Total Local Cost = $11,890,000
26


STATE OF MARYLAND PUBLIC SCHOOL CONSTRUCTION PROGRAM (PSCP)
Problem: Existing building exceeds State eligible scope
Local Strategies:
Partial Renovation: Fully renovate selected areas of school
Limited Renovation: Upgrade minimum of five building systems, and carry out extensive architectural and educational improvements
Cooperative Use Arrangement: Assign a portion of building to community partner (non-profit or governmental agency)
Mothball a portion of the building for later use and occupancy
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