Purpose:
• Study to identify feasible project options for the elementary schools and high school in the Christiansburg Strand

• Used as a planning document to help prioritize, plan, and further define Christiansburg Strand School projects on the Capital Improvement Plan.

Contents:
• Compares area of spaces at Christiansburg High School with areas at the New Blacksburg High School (with classrooms for 1,600 students)

• Documents and categorizes the condition of building and site systems and components

• Establishes an estimated rate of enrollment growth (1.5% per year)

• Identifies current zones of residential development in the Christiansburg Strand

• Identifies development options for each school and scores them to understand their feasibility

• Presents development options for the elementary schools and Christiansburg High School

• Order of magnitude cost estimates and contemplated phasing for elementary development options
CHS Space, Condition, and Enrollment

* Enrollment as of March 31, 2014

- Christiansburg High School
  - Opened in 1974 (No Additions)
  - 224,749 sf
  - Current enrollment = 1,017 + 51*
    * students attending from other schools
  - Capacity = 1,216
  - 3 Mobile units
  - 67% of building & site systems and components have reached their average useful life

- New Blacksburg High School
  - 1,400 student classroom capacity
  - 1,600 student core capacity
  - 293,286 square feet

- New Blacksburg High School at full build-out used for CHS space comparison
  - Assume a new or renovated & expanded CHS will have a student capacity of 1,600
  - Area of a 1,600 student BHS is approximately 304,000 sf

1.5% per year enrollment growth

Projected Enrollment for High School

- 1,017 students In 2014
- 1,216 current capacity
- At capacity in 2027
- 1,170 students In 2024
- 1,322 students In 2034
- 1,520 students In 2044
Scoring Project Options to Understand Feasibility

Christiansburg High School Project Options Assessment Matrix

- All schools were assessed against the same criteria.
- OCMS was not assessed by this method, since it is unoccupied.

<table>
<thead>
<tr>
<th>Project Options</th>
<th>Site Size</th>
<th>Existing Building Design</th>
<th>Utilities</th>
<th>Zoning / Location</th>
<th>Costs</th>
<th>Traffic</th>
<th>Impact of construction on educational environment</th>
<th>21st Century Learning Environment</th>
<th>Feasibility Score of Project Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>New 1,600 High School on new unknown site</td>
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<td>Less feasible (2 Green)</td>
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<tr>
<td>Renovations, 2-Story classroom addition, and auxiliary gym addition to create 1,500 CHS</td>
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<td>Renovations, 3-Story classroom addition, and auxiliary gym addition to create 1,500 CHS also housing MCPS Technology department</td>
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1. Assumes new classroom wing will not accommodate the entire student body, thus requiring total relocation or complicated phasing of renovations.
2. Assumes new classroom wing could be occupied while existing building is renovated in stages.
Scoring Project Options to Understand Feasibility

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1. Assumes new classroom wing will not accommodate the entire student body, thus additional space may be needed.
2. Assumes new classroom wing could be occupied while existing building is renovated.
## Scoring Project Options to Understand Feasibility

### Christiansburg High School Project Options Assessment Matrix

<table>
<thead>
<tr>
<th>Considerations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Feasibility Score of Project</th>
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<tbody>
<tr>
<td>Existing Building Design</td>
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<td>Site Size</td>
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<td>Site will be right, additional land required</td>
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<td>Moderate improvements needed</td>
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<tr>
<td>Moderate compatibility for additions and renovations</td>
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<td>Some site work required, such as temporary wall; may accommodate repurposing</td>
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<td>Zoning allows development and location not central to need</td>
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<td>Expected average costs or substantial savings from reuse or construction</td>
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<td>Traffic on site can be managed by adding turn lanes</td>
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<td>Traffic can be managed by adding or traffic signals required</td>
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<td>Traffic on site due to VDOT regulations</td>
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<td>Minor modifications to existing spaces required</td>
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<td>Lack of space to allow functional design</td>
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**Parity with BHS**
### Scoring Project Options to Understand Feasibility

**CHS**

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1. Assumes new classroom wing will not accommodate the entire student body, therefore additional classrooms would need to be added.
2. Assumes new classroom wing could be occupied while existing building is readily available.
Cost Estimates

Approximate estimated costs per square foot (Construction only):

- New high school construction $223/sf - $247/sf ---------(BHS in 2012 $187/sf)
- Substantial renovations at CHS $130/sf - $144/sf

- These estimated sf costs assume a 2015 bid
- Increase estimates at 2.6% per year after 2015
- Cost of new land purchase is not included

Soft costs included in the estimates (In addition to sf costs):

- 8% (of estimated cost of construction) Design fee for renovations
- 6% (of estimated cost of construction) Design fee for new construction
- 15% (of estimated cost of construction) Fixtures, Furnishings, and Equipment allowance
- 10% (of estimated cost of construction) Study phase project contingency allowance

Sources:

Recent bidding activity, VADOE cost records, OWPR historical cost data, Engineering News-Record (ENR)

Recent data:  
- New Heritage High School (Lynchburg) (April, 2014 bid @ $238/sf)
- New Frederick County Middle School (September, 2014 bid @ $240/sf)
Questions Regarding the Process?
Christiansburg High School Development Options

New 1,600 student high school on a new site (No site considered)

This option is more feasible because students could occupy the existing building until the new CHS is complete, and no curriculum or athletics are displaced during construction.

Estimated Cost $89M – $99M

Current 9-12 Christiansburg Strand Capacity: 1,216 students
New 9-12 Enrollment Capacity of Christiansburg Strand: 1,600 students

Pros:
• Does not disrupt existing CHS operations, curriculum, or athletics
• Provides a campus planned without regard to existing construction
• Removes CHS traffic from the area
• Adds sufficient student capacity
• A portion of the existing CHS site could serve as an elementary school site, while the remaining CHS site could be sold or repurposed.

Cons:
• Expenses incurred for land purchase and likely offsite improvements

Low cost / no cost steps that may be taken now to facilitate this option:
• Begin discussions with Board of Supervisors to plan funding
• Search for property for a new CHS
• Asbestos abatement in preparation of demolition
Christiansburg High School Development Options

New 1,600 student high school on current CHS site
(Built on existing CHS athletic fields)

This option is moderately feasible because students could occupy the existing building until the new CHS is complete. But, some outdoor athletics will be displaced for at least three years.

Estimated Cost $90M – $100M

Current 9-12 Christiansburg Strand Capacity: 1,216 students
New 9-12 Enrollment Capacity of Christiansburg Strand: 1,600 students

Pros:
• Utilizes existing assets
• Keeps CHS in its current location
• Adds sufficient student capacity
• Allows students to remain in existing CHS until the new school is finished
• The new school will create a buffer between part of the residential area and new athletic fields

Cons:
• Outdoor athletics must be relocated for at least three years (cost, location, transportation, etc.)
• Brings more traffic to the site

Low cost / no cost steps that may be taken now to facilitate this option:
• Begin discussions with Board of Supervisors to plan funding
• Asbestos abatement in preparation of demolition
• Plan for displacement of athletics until old CHS is demolished and new sports facilities are built
Christiansburg High School Development Options

NEW 1,600 HIGH SCHOOL ON EXISTING ATHLETIC FIELDS (DOES NOT REQUIRE RELOCATING STUDENTS. DOES REQUIRE RELOCATING ATHLETICS)

MCPS Christiansburg Strand Schools Study
Christiansburg High School (43.4 Acres)
Town of Christiansburg, Virginia

October 3, 2014
Christiansburg High School Development Options

Two-story addition and renovations at CHS to accommodate 1,600 students

This option is less feasible because renovations would significantly impact the use of critical areas, i.e. cafeteria, band, chorus, auditorium, gymnasium, and CTE. Depending on enrollment at the time of construction, part, if not all of the student body may be housed in the new addition during renovation of the existing building, though student circulation around construction zones would be likely.

Estimated Cost $71M – $79M

Current 9-12 Christiansburg Strand Capacity: 1,216 students
New 9-12 Enrollment Capacity of Christiansburg Strand: 1,600 students

Pros:
• Utilizes existing assets
• Keeps CHS in its current location
• Adds sufficient student capacity
• Disruptions to outdoor athletics would likely be minor
• Provides classrooms with windows to replace most existing interior classrooms

Cons:
• Cost is relatively high when compared to new construction ($71M-$79M vs. $89M-$99M)
• Construction will occur near students if they are not relocated during renovations
• Disruptions to the learning environment are likely
• Sports that use the gymnasium and weight room may be displaced by construction
• Curriculum that will presumably occupy renovated spaces (Band, Chorus, CTE, etc.) may be displaced by renovations. Many of these subjects require specialized space and are not easily relocated.

Low cost / no cost steps that may be taken now to facilitate this option:
• Begin discussions with Board of Supervisors to plan funding
• Asbestos abatement in areas of future work
Christiansburg High School Development Options

ADDITIONS AND RENOVATIONS FOR 1,600 CAPACITY, ALT ED, AND AUX GYM – ATHLETICS AND PARKING CONFIGURATION 2

MCPS Christiansburg Strand Schools Study
Christiansburg High School (43.4 Acres)
Town of Christiansburg, Virginia

October 3, 2014

OWPR
ARCHITECTS AND ENGINEERS

SITE DEVELOPMENT ASSESSMENT

LEGEND
No development obstacles
Moderate development obstacles
Major development obstacles

SITE FEATURES
Site Acreage
50 acres
Stadium
Practice Football Practice Soccer Multi-Purpose Fields Softball Fields Baseball Field Tennis Court Basketball Courts Outdoor Learning Area

ZONING
Conformance with Comp Plan
Allowed Use
Special Use
Lot Coverage
Green Space
Paving
Sprinkler Changes/Water Required

UTILITIES
Water
Sanitary Sewer
Electricity
Gas
Storm Sewer/Stormwater Mgmt
Christiansburg High School Development Options

Three-story addition and renovations at CHS to accommodate 1,600 students and MCPS Technology (Technology Dept. would be housed within the existing CHS building in a newly renovated area)

This option is less feasible because renovations would significantly impact the use of critical areas, i.e. cafeteria, band, chorus, auditorium, gymnasium, and CTE. All of the student body may be housed in the new addition during renovation of the existing building, though student circulation around construction zones would be likely.

Estimated Cost $77M – $85M

Current 9-12 Christiansburg Strand Capacity: 1,216 students
New 9-12 Enrollment Capacity of Christiansburg Strand: 1,600 students

Pros:
• Utilizes existing assets
• Keeps CHS in its current location
• Adds sufficient student capacity
• Disruptions to outdoor athletics would likely be minor
• Provides classrooms with windows to replace all existing interior classrooms
• Provides a new location for the MCPS Technology Dept. inside the existing CHS building
• Because the new addition is larger it could likely accommodate the entire student body during construction

Cons:
• Cost is relatively high when compared to new school construction only($77M-$85M vs. $89M-$99M)
• Construction will occur near students if they are not relocated during renovations
• Disruptions to the learning environment are likely
• Sports that use the gymnasium and weight room may be displaced by construction
• Curriculum that will presumably occupy renovated spaces (Band, Chorus, CTE, etc.) may be displaced by renovations. Many of these subjects require specialized space and are not easily relocated.
Christiansburg High School Development Options

MCPS Christiansburg Strand Schools Study
Christiansburg High School (43.4 Acres)
Town of Christiansburg, Virginia
October 3, 2014

SITE DEVELOPMENT ASSESSMENT

LEGEND

No development obstacles
Minor development obstacles
Major development obstacles

SITE FEATURES

Site Acreage
Field Tennis
Stadium
Practice Football
Practice Soccer
Multi-Purpose Fields
Softball Fields
Basketball Field
Tennis Courts
Basketball Courts
Outdoor Learning Area

ZONING

Conformance with Camp Plans
Allowed Use
Setbacks
Lot Coverage
Green Space
Parking
Zoning Changes/Varies Required

UTILITIES

Water
Sanitary Sewer
Electrical
Gas
Storm Sewer/Stormwater Management
Considerations

1. Renovations and additions at CHS, or build new?

2. If building new: use existing CHS site, or build on a new site?

Potential Future Actions

a. Discuss funding availability and timing with Board of Supervisors (prior to defining a strategy for implementing the Capital Improvement Program).

b. Search for property and fund a site study if a new Christiansburg High School on a new site is pursued.