

# A Review of the MCPS Revitalization/Expansion Program

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## NOTE TO READERS

In preparing this report, OLO selected three nouns to describe activities to improve and upgrade aging school facilities. These nouns have similar meanings but with distinguishing differences. For the purpose of this report, the following definitions apply:

- **Modernization** refers to capital improvements to improve the educational and physical conditions of aging school buildings.
- **Revitalization/Expansion** refers to the name applied to the MCPS modernization program beginning in 2014.
- **Reconstruction** refers to the most frequent outcome of the MCPS Revitalization/Expansion projects, namely, the complete or near complete reconstruction of an existing school building in its current location.

## Executive Summary

# A REVIEW OF THE MCPS REVITALIZATION/EXPANSION PROGRAM

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OLO Report Number 2015-12

July 28, 2015

The County Council directed the Office of Legislative Oversight (OLO) to prepare a report on the Montgomery County Public Schools (MCPS) "Revitalization/Expansion" program. Formerly known as the "Modernization" program, Revitalization/Expansion is the MCPS program to replace aging school buildings.

### **Program Description and Policies**

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In the early 1990s, MCPS developed a standardized system, known as "Facilities Assessment with Criteria and Testing (FACT)," to evaluate the condition of school buildings. MCPS updated the FACT methodology and conducted a new round of assessments in 2011. The 2011 FACT methodology included educational and infrastructure criteria (known as "parameters"). The educational parameters evaluated school building characteristics that directly influence student instruction while the infrastructure criteria evaluated the physical condition of the school buildings.

The FACT scoring system did not include a comparison of school enrollment with school capacity. As a result, capacity considerations did not affect whether or when a particular school is included in the Revitalization/Expansion program. Other MCPS capital programs, most notably building additions, are intended to address capacity needs. However, once a school is scheduled for the Revitalization/Expansion, MCPS may include capacity considerations in the project scope to accommodate projected enrollment.

When developing the scope of a Revitalization/Expansion project, MCPS conducts a feasibility study to determine the scope of the capital improvement project. Most often, this process results in the complete or near complete reconstruction of the building. MCPS has concluded that building reconstruction frequently costs less than building renovation or rehabilitation.

The MCPS Educational Facilities Master Plan indicates that all schools assessed in 2011 eventually will be modernized in the order of their ranking in the Revitalization/Expansion program queue. MCPS has not re-assessed the schools in the Revitalization/Expansion program queue since 2011 nor does the school system plan to reassess the condition of these buildings in the future.

### **Age and Location of School Buildings and Modernizations**

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MCPS school buildings (elementary, middle, and high schools) have an average age of 25.1 years. The oldest school buildings include reopened, special program, and holding schools.

OLO found that a geographic disparity, but not a bias, exists in the location of school modernization projects. School modernizations track the MCPS construction history; the largest concentration of modernizations has occurred in areas of the County with the oldest school buildings (Downcounty Consortium and Southwest Quad Cluster). This trend will start to shift in upcoming years as planned future modernization projects are focused in the Northwest and Northeast Quad Clusters.

Over the past several decades, the average age of an MCPS school at the time of modernization has increased from 32 years to 51 years. The CIP anticipates the 21 school Revitalization/Expansion projects programmed for 2016 through 2023 will have an average age of 46 years when completed. However, any changes to the planned schedule between 2016 and 2023 would alter the average age.

## Executive Summary

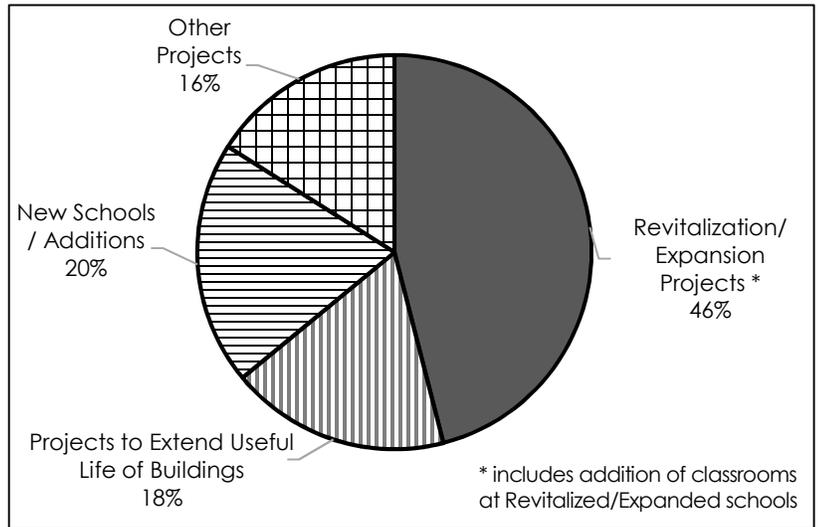
### Capital Expenditures

In FY12-FY16, nearly half of all MCPS capital expenditures have been spent on the Revitalization/ Expansion capital program. The FY16 approved Capital Improvements Program (CIP) includes \$120.7 million for the Revitalization/ Expansion capital project. When a school undergoes improvements through the Revitalization/Expansion program, the capital project frequently includes the addition of classrooms and other space to accommodate projected enrollment.

The CIP also includes at least eleven projects to extend the useful life of schools through upgrade and replacement of major building systems (such as ventilation, fire suppression, and roofing).

For FY16, the CIP budgeted a total of \$49.8 million for these projects. Thus, the CIP assumes that MCPS will spend about two-and-a-half times as much in FY16 for Revitalization/Expansion program (\$120.7 million) than it will spend for upgrades and improvements to major school building systems.

Allocation of MCPS Capital Expenditures, FY12-FY16



### Analysis of 2011 FACT Assessment

OLO reviewed the 2011 FACT assessment methodology and scoring system that resulted in the current Revitalization/Expansion program queue. OLO found that the queue was determined through a quantitative process based on defined criteria. Moreover, OLO found no evidence of bias or subjective decision-making in the scoring of individual schools.

The educational program criteria identified deficiencies that would require significant structural and building design modifications to correct. As such, these criteria are pertinent in evaluating the need to reconstruct a building.

The physical infrastructure criteria addressed significant structural deficiencies in school buildings that are pertinent to a building reconstruction needs assessment. However, many of the physical infrastructure criteria involved methodologies that evaluated impermanent conditions. This approach is incompatible with establishment of a permanent queue that most frequently results in building reconstructions. For example, several schools in the Revitalization/Expansion queue have undergone capital improvements to upgrade or replace key building systems. As the FACT assessments were a one-time undertaking, no mechanism exists to adjust scores to account for post-assessment capital improvements. In addition, the FACT methodology relied on one or two years of data to assign scores for measures that have the potential for significant annual variation (including utility consumption, maintenance costs, and community use). OLO found that FACT methodology did not survey a sufficient time span to correct for one-year data outliers or to identify shifting trends. OLO questions the use of measures that vary from year to year in establishing a queue that is intended to remain unchanged for at least two decades.

Further, OLO determined that the calculation of FACT scores included multiple mathematical errors. Correction of these errors would alter the results of the 2011 FACT assessments and the rankings of some schools in the queue. Given the condensed range of scores, even a small change in FACT scoring could have a significant effect on the placement of a school in the queue.

## Executive Summary

### Modernizations in Other School Districts

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OLO studied the school modernization practices in five other jurisdictions: Anne Arundel County, Baltimore County, Dallas, DeKalb County (GA), and Fairfax County. OLO selected school districts that have similar characteristics to Montgomery County in regard to public school enrollment and the age and number of school buildings. Similar to MCPS, each of the five school districts evaluate the physical condition and educational suitability of school buildings.

However, OLO observed significant differences between MCPS and the other districts. Each district employs a building evaluation process to assess the need for both school renovation and reconstruction. In these districts, the most common outcome of the assessment process is targeted renovations; only schools with the worst conditions are designated for reconstruction. Some school districts use a methodology called the Facility Condition Index to compare the cost of building renovation with the cost of building replacement. In comparison, MCPS Revitalization/ Expansion projects most frequently involve complete or near complete reconstruction of a school building.

Four of the five school districts studied include all school buildings – regardless of age – in their facility assessments. This practice allows for the development of a systemwide inventory of all school building deficiencies to be used for capital improvement planning purposes. In contrast, the FACT process employed by MCPS almost exclusively assessed buildings over a designated age.

MCPS has a longer planned duration for its modernization queue than any school system studied by OLO. The current MCPS queue is intended to remain unchanged for at least two decades. The other school districts periodically (usually between five and ten years) re-assess the condition of their schools and revise their capital improvements plan accordingly.

Each of the other school districts make school building assessment reports available to the public via the internet. In 2011, MCPS posted the results of the FACT assessments on its website. At present, however, the school-specific FACT results are not available online.

### Discussion Questions

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Based on the findings of this report, OLO suggests that the Council discuss the following questions with MCPS representatives.

1. What should be the relationship between the Revitalization/Expansion program and other elements of the MCPS Capital Improvements Program including projects to extend the useful life of existing buildings (such as roof and HVAC replacements) and projects to address capacity issues (such as additions)?
2. What is the optimal relative allocation of capital dollars spent on school building modernizations versus improvements that extend the useful life of school buildings?
3. What should be the planned useful life of a school building? Under what circumstances should a school building be reconstructed?
4. Should the 2011 FACT assessments be the basis for the sequencing of a school modernization queue that could extend for at least 20 years? Should MCPS periodically re-evaluate school conditions and their relative need for modernization?
5. What information about school building assessments should be made available to the public?

**Office of Legislative Oversight Report 2015-12**

**A REVIEW OF THE MCPS REVITALIZATION/EXPANSION PROGRAM**

**TABLE OF CONTENTS**

Executive Summary ..... i

I. Authority, Scope, and Organization ..... 1

II. Program History ..... 3

III. MCPS Policies and Practices..... 12

IV. Capital Improvement Expenditures ..... 15

V. Age and Location of School Buildings and Modernizations..... 23

VI. Analysis of 2011 FACT Scoring ..... 38

VII. School Modernization Programs in Other Jurisdictions..... 57

VIII. Findings and Discussion Questions..... 65

VI. Agency Comments ..... 69

Appendix A: Example MCPS Feasibility Study Process – Brown Station Elementary School

## **CHAPTER I. AUTHORITY, SCOPE, AND ORGANIZATION**

### **A. Authority**

Council Resolution 17-1183, *FY 2015 Work Program for the Office of Legislative Oversight*, adopted July 29, 2014.

### **B. Project Scope and Methodology**

The County Council directed the Office of Legislative Oversight (OLO) to prepare a report on the Montgomery County Public Schools (MCPS) “Revitalization/Expansion” program. Formerly known as the “Modernization” program, the Revitalization/Expansion program is the MCPS effort to replace aging school buildings. The program is funded through the County’s capital budget and accounts for nearly one-half of total annual MCPS capital expenditures.

This report describes the program history and the current MCPS policies and practices that shape program implementation. The report provides information about planned capital expenditures for the Revitalization/Expansion program as well as other MCPS capital projects intended to extend the useful life of school buildings. To provide further context for the budget data, the report includes data on the average age of the school buildings at the time of modernization and the geographic distribution of modernization projects. The report contains an analysis of the scoring system that produced the current Revitalization/Expansion program queue. Finally, the report presents information about school modernization practices in other jurisdictions.

OLO staffers Aron Trombka and Stephanie Bryant prepared this report with editorial and production assistance from Kelli Robinson. OLO conducted this study by reviewing MCPS policies and budget documents, analyzing Revitalization/Expansion program reports and worksheets, and conducting interviews with staff of MCPS and other public school systems.

### **C. Organization of Report**

**Chapter II, Program History**, presents a brief history of the MCPS school modernization program and details the assessment criteria used to evaluate schools for modernization.

**Chapter III, Capital Funding**, provides an overview of the policies and practices that govern MCPS’ capital improvements program, with particular emphasis on the Revitalization/Expansion program.

**Chapter IV, Capital Improvement Expenditures**, presents information about the expenditure levels programmed in the Capital Improvements Program for MCPS Revitalization/Expansion projects as well as building system improvements to extend the useful life of school buildings.

**Chapter V, Age and Location of School Buildings and Modernizations**, presents data and analysis regarding the age of MCPS schools as well as the location and building age of modernization projects.

**Chapter VI, Analysis of 2011 FACT Scoring**, examines the 2011 MCPS assessment of school buildings and the placement of schools in the queue for reconstruction as part of the Revitalization/Expansion program.

**Chapter VII, School Modernization Programs in Other Jurisdictions**, examines school modernization programs in other jurisdictions with a focus on assessments, project prioritization, and public availability and format of assessment scores.

**Chapter VIII, Findings and Discussion Questions**, summarizes the major findings of the report and presents suggested questions for the Council to discuss MCPS.

**Chapter IX, Agency Comments**, includes comments from the MCPS Interim Superintendent on the findings of this report.

#### **D. Acknowledgements**

OLO received a high level of cooperation from MCPS and Legislative Branch staff. We acknowledge the invaluable contributions of:

- Bruce Crispell, MCPS
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## **CHAPTER II: PROGRAM HISTORY**

This chapter presents a brief history of the MCPS school modernization program and details the assessment criteria used to evaluate schools for modernization. The chapter includes four sections:

- Section A. Previous School Modernization Projects
- Section B. 1993-1999 FACT Assessments
- Section C. 2011 FACT Assessments and Planned Future Modernizations
- Section D. Revitalization/Expansion Program: Duration of Queue and Scope of Projects

### **A. Previous School Modernization Projects**

MCPS first began modernizing existing school buildings in the 1960s. During this era, MCPS evaluated schools that were at least 30 years of age for possible modernization. At the time, MCPS considered a school modernization to be "... the design, construction, and equipping process through which an aging school facility is brought up to current educational standards ... and through which its systems are renewed and updated to meet, school, county, state, and federal codes and requirements."<sup>1</sup> MCPS policy acknowledged that modernizations may require the addition or redesign of space to meet educational program requirements.<sup>2</sup>

Between 1961 and 1992, MCPS modernized 30 elementary schools, five middle schools, and three high schools.<sup>3</sup>

### **B. 1993-1999 FACT Assessments**

MCPS developed a standardized system in 1992-93 to evaluate the physical condition and educational program capability of school buildings known as "Facilities Assessment with Criteria and Testing (FACT)." Under the FACT scoring system, schools in worse condition received lower scores than schools in better condition.<sup>4</sup>

MCPS developed the physical condition criteria based on advice from facilities and planning staff members, experts from other jurisdictions, and the Maryland State Department of Education School Construction Department. A team of technicians evaluated each school and applied weighted scores based on a variety of building aspects, with a final score calculated at a maximum of 1,000 points. MCPS instructional staff, planning and facilities staff, school principals, and parent-teacher association representatives collaborated to develop the educational program assessment criteria. Based on a 1,000

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<sup>1</sup> Montgomery County Board of Education Policy FKB, October 9, 1991. Policy FKB was subsequently amended in 2010 (see Chapter III of this report).

<sup>2</sup> *Ibid.*

<sup>3</sup> FY16 Educational Facilities Master Plan, Chapter 4.

<sup>4</sup> *Ibid.*, Appendix F. *See also*, Superintendent Joshua P. Starr to Members of the Montgomery County Board of Education, "Recommendations for Facilities Assessment with Criteria and Testing Assessment Parameters: Appendix A" [Memorandum], Office of the Superintendent of Schools, MCPS, June 15, 2010.

point scale, the educational program criteria assessed how well schools conformed with instructional space, safety, security, and energy conservation standards.<sup>5</sup>

In 1993, MCPS applied the newly developed FACT assessment criteria to 37 elementary and secondary schools. In 1996, MCPS assessed an additional 35 schools. Schools selected for assessment in 1996 were either built before 1970 and never modernized or were renovated before 1977. In 1999, MCPS assessed seven high schools. Schools in subsequent assessment rounds were placed behind schools in the established queue.<sup>6</sup>

### **C. 2011 FACT Assessments and Planned Future Modernizations**

With the last three elementary schools from the previous modernization queue programmed for completion in less than a decade, MCPS decided to update the FACT methodology and conduct a new round of assessments in 2011. In 2014, MCPS renamed the school modernization effort as the Revitalization/Expansion program. MCPS determined that the new name better reflected capital projects that included both facility modernizations and capacity improvements.

#### **1. Process of Updating the FACT Methodology**

Beginning in March 2010, the Board of Education tasked MCPS staff to develop a process for updating the FACT methodology. Over the next several months, MCPS instructional and facilities management staff sought input on the proposed process from an advisory FACT Review Committee consisting of parent-teacher associations, State and County Government officials and staff, and architectural consultants.<sup>7</sup> In updating the FACT evaluation criteria (called “parameters”), MCPS reviewed the previous methodology to identify characteristics that were no longer appropriate to evaluate and to identify more relevant criteria. One factor included in the previous FACT methodology, but not in the 2011 methodology, was the projected overutilization of a school. MCPS determined that many schools in the queue also required additions prior to modernization. As noted by MCPS staff:

This resulted in schools which still held a place in the queue, based in part on overutilization, were no longer over utilized. The new FACT methodology reflects conditions at schools that are unlikely to be resolved prior to their Revitalization/Expansion project.<sup>8</sup>

Similar to the 1992 FACT methodology, the advisory committee included both educational program and physical infrastructure parameters in the revised 2011 FACT methodology. As in the previous methodology, the educational program parameters compared building core and instructional space with established facility standards. In addition, the 2011 methodology included parameters such as building safety and security features.<sup>9</sup>

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<sup>5</sup> Superintendent Jerry Weast to Members of the Montgomery County Board of Education, “Recommendations for Facilities Assessment with Criteria and Testing Assessment Parameters: Appendix A” [Memorandum], Office of the Superintendent of Schools, MCPS, June 15, 2010, available at <http://www.montgomeryschoolsmd.org/boe/meetings/agenda/2009-10/2010-0622/FACT.pdf>.

<sup>6</sup> FY16 Educational Facilities Master Plan, Appendix F.

<sup>7</sup> Memorandum from James Song, Director of MCPS Department of Facilities Management to Aron Trombka, OLO Senior Legislative Analyst, March 17, 2015.

<sup>8</sup> Memorandum from James Song, Director of MCPS Department of Facilities Management to Aron Trombka, OLO Senior Legislative Analyst, May 8, 2015.

<sup>9</sup> *Ibid.*

For the physical infrastructure parameters, the advisory committee identified current design requirements for school sites and buildings, including environmental conditions, access for the disabled, and the conditions of building systems (i.e. mechanical, plumbing, electrical, security, and fire protection).

According to MCPS, “the FACT Review Committee was well aware that facility conditions change over time. Nevertheless, the prevailing view was that a comprehensive condition assessment needed to include all the parameters that are included in FACT. In addition, these parameters were similar to those used in the industry, as conveyed by the consultant EMG, Inc.”<sup>10</sup>

Working with the consulting firm, EMG, Inc., MCPS staff finalized the assessment criteria, developed a scoring system, and assigned weights to various elements. The Board of Education adopted an updated FACT methodology and the list of schools on July 8, 2010.<sup>11</sup> The approved parameters are found on pages 6 and 7 below.

## **2. FACT Assessment Criteria, Scoring, and Weights**

The criteria incorporated into the 2011 FACT methodology included some aspects of the industry standard, known as a Facility Condition Index (FCI), to measure a building’s condition. However, MCPS elected to expand its facility evaluation criteria beyond the FCI standard. As stated in the approved FACT methodology:

The usefulness of the FCI in this study was limited in that each facility was evaluated based on deficiencies with respect to current educational specifications and program requirements, space standards and modern building system needs. As such, the employed methodology was developed to account for deficiencies beyond existing building envelope and systems, and evaluated need for system upgrades instead of replacement with “like kind”.<sup>12</sup>

To differentiate the new scoring system from the previous FACT assessments, the methodology was based on a 600 point scale with buildings in worse condition receiving a higher score than buildings in better condition. The FACT Review Committee, affirmed by the Superintendent and the Board of Education, determined that the educational program and physical infrastructure parameters should be weighed equally, with each receiving a possible maximum score of 300 points. (See page 41 for a tree diagram portraying the point breakdown for each parameter). According to MCPS staff, MCPS weighted the two parameter categories equally because “many of the factors interrelate and in a sense all the conditions at a school affect the ability of the facility to serve students in an excellent learning environment.”<sup>13</sup>

EMG assisted MCPS staff with assigning relative weights to the assessed characteristics. For the educational program parameters, MCPS assigned 228 points (76% of the total educational program points) to assessment of a building’s conformity with current space standards for the school core, instruction spaces, classrooms, support areas, and administrative spaces. In addition, MCPS allocated 42 points (14%) to the presence of an open-space plan and 30 points (10%) related to controlled access to the school.

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<sup>10</sup> Email correspondence from Bruce Crispell to Aron Trombka, July 16, 2015.

<sup>11</sup> James Song, March 17, 2015.

<sup>12</sup> “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” page 6.

<sup>13</sup> James Song, May 8, 2015, page 3.

**2011 FACT Assessment Educational Parameters**

<b>Parameter</b>	<b>Definition</b>
<b>Open Plan Schools</b>	Schools that were originally designed as open plan, then retrofitted, but still include non-full-height walls, windowless classrooms, and indirect access to common spaces.
<b>Controlled Access</b>	Includes the administrative security features, such as the ability to control visitor access into the building.
<b>Specialized Instruction</b>	Science, math, art, technology education, computer laboratory, and special instruction.
<b>Core</b>	Multipurpose room, gymnasium, and instructional media center.
<b>Classrooms</b>	Prekindergarten, kindergarten, and standard classrooms.
<b>Educational Support</b>	Instructional support rooms, English for Speakers of Other Languages (ESOL), resource rooms, and testing areas.
<b>Administrative</b>	Administrative suite, health services suite, staff development area, staff lounge, building service facilities, and Parent Teacher Association storage rooms.

Source: EMG Consultants and Montgomery County Public Schools, "Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report."

**2011 FACT Assessment Physical Infrastructure Parameters**

<b>Parameter</b>	<b>Definition</b>
<b>Utility and Energy Efficiency</b>	Compares the school's energy use index to state and MCPS benchmarks.
<b>Maintenance Costs</b>	Compares the individual school's maintenance costs relative to other MCPS schools.
<b>Community Use of Public Facilities</b>	Compares the hours of community use associated with each school building, such as after-school programs, gymnasium use, PTA activities, day care, and summer school.
<b>Facility Design Guidelines</b>	Building components and systems installed at the school that impact the ability to meet current codes and standards. These components include the following: site, building envelope, security, fire protection, building interior, mechanical systems, electrical systems, plumbing systems, and ability to upgrade without modernization. (See definitions below for each component).
<b>Site</b>	Limited to parking, playfields, and site amenities. Includes an evaluation of adequate parking spaces for elementary and middle schools, adequate traffic lanes, separate bus lanes, access for deliveries, safe and separate paths and drop-offs for students, and accessibility and stormwater management compliance.
<b>Building Envelope</b>	Includes exterior walls, roofs, and overall building structure. Identified air and water penetration at insulated or uninsulated areas. When scoring roofs, open air steel joists issues, such as deterioration and visible rust were assessed. Wooden load-bearing systems were noted.
<b>Security</b>	Includes of the schools security system (public address system; telephone access, closed-circuit television; data, voice and modem receptacles; and interior isolation doors).
<b>Fire Protection</b>	Includes primarily an evaluation of sprinklers and fire panels with provisions for schools that were partially retrofitted. Compliance with the Americans with Disabilities Act and other code and guideline compliance was scored.
<b>Building Interior</b>	Includes means of egress, classroom walls, direct access to corridors, accessibility compliance, presence of hazardous materials (lead, asbestos) and evidence of pest infestation. Includes an assessment of classrooms without direct access to corridors.
<b>Mechanical Systems</b>	Consists of an evaluation of the control systems, including a discussion regarding the extent and capabilities of an energy management system. Compliance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers 62.1 indoor air quality standard and outside air intake standards.
<b>Electrical Systems</b>	Measures the adequacy of power delivered to the school and classrooms, Lighting and energy using equipment, and emergency back-up electrical systems.
<b>Plumbing Systems</b>	Includes the adequacy of the existing piping, domestic water heating and distribution, and bathroom fixtures.
<b>Ability to Upgrade w/o Modernization</b>	Recognizes the potential to upgrade and modernize outdated or obsolete systems without full modernization, including site constraints, electrical capacity, building orientation, expandability of building systems, and structural aspects.

Source: EMG Consultants and Montgomery County Public Schools, "Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report."

For the physical infrastructure, MCPS assigned a total of 200 points (67% of the total) among nine facility condition parameters including mechanical systems, building envelope, security, building interior, fire protection, electrical systems, plumbing, and site conditions. Of the remaining points, MCPS allocated 37.5 points (12.5%) each to utility/energy efficiency and maintenance costs. The final 25 points were allocated to a measure of community use of the school facility.<sup>14</sup>

The FACT scoring system did not include a comparison of school enrollment with school capacity. As stated in the description of the school assessment methodology, “characteristics that may change over time or may be addressed by other capital programs, such as additions to relieve capacity shortages, also are not included in the FACT methodology.”<sup>15</sup> As a result, capacity considerations do not affect whether or when a particular school is included in the Revitalization/Expansion program.<sup>16</sup> Nonetheless, once MCPS includes a school in the Revitalization/Expansion program, the scope of the capital project may address capacity concerns. As stated in the MCPS Educational Facilities Master Plan, “some schools that are scheduled for Revitalization/Expansion projects also have increases in capacity as part of the project to accommodate growing enrollment.”<sup>17</sup> Once a school identified for Revitalization/Expansion is approved in the six-year CIP, the capital project may include the addition of classrooms and other space to accommodate projected enrollment.

EMG developed scoring worksheets for schools examiners. Examiners measured a total of 132 items in the area of educational program related parameters and 110 items in the area of physical infrastructure parameters.<sup>18</sup> The scoring of the facilities developed a priority ranking, similar to the previous FACT assessments. The schools assessed in 2011 are ranked below those already in the queue.

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<sup>14</sup> “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” pages 9-10.

<sup>15</sup> EMG Consultants and Montgomery County Public Schools, “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” October 11, 2011, p. 6.

<sup>16</sup> MCPS manages other capital projects to add space to schools for which projected enrollment exceeds building capacity. The current CIP includes projects to build additions to six school buildings.

<sup>17</sup> FY16 Educational Facilities Master Plan Program, page 3-5.

<sup>18</sup> “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” pages 9-10.

### 3. 2011 FACT Assessed Schools

The Board of Education approved a list of 53 schools for 2011 FACT assessments. The majority of schools chosen were built prior to the mid-1980s and never modernized, although some renovation work may have been performed at these schools. In addition, MCPS elected to assess five schools built or modernized after 1985 because of building condition.<sup>19</sup> The 53 schools include: 34 elementary schools, 11 middle schools, three special education program centers, one alternative program center, and four elementary school holding centers.<sup>20</sup>

#### Elementary Schools

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- Cold Spring ES
- DuFief ES
- Belmont ES
- Stonegate ES
- Damascus ES
- Twinbrook ES
- Summit Hall ES
- Rosemary Hills ES
- Burnt Mills ES
- Poolesville ES
- Woodfield ES
- South Lake
- Cedar Grove ES
- Greenwood ES
- Piney Branch ES
- Whetstone ES
- Takoma Park ES
- Gaithersburg ES
- Strathmore ES
- Diamond ES
- Fox Chapel ES
- East Silver Spring ES
- Broad Acres
- Woodlin ES
- Germantown ES
- Fallsmead ES
- Watkins Mill ES
- Fields Road ES
- Stedwick ES
- Cloverly ES
- Darnestown ES
- Washington Grove ES
- Bradley Hills ES
- Sherwood ES

#### Middle Schools

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- Banneker MS
- Argyle MS
- Newport Mill MS
- Ridgeview MS
- Silver Spring International MS
- Neelsville MS
- Baker MS
- Frost MS
- Loiederman MS
- Redland MS
- North Bethesda MS

#### Holding Schools, Special Education, and Alternative Program Centers

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- Radnor Holding Center
- Grosvenor Holding Center
- Fairland Holding Center
- North Lake Holding Center
- Carl Sandburg Learning Center
- Rock Terrace School
- Stephen Knolls School
- Blair G. Ewing Center

In 2011, the Board added Northwood to the future modernization queue, immediately after Damascus High School.

MCPS did not place special education and alternative education centers in the modernization queue as the school system has undertaken efforts to co-locate these facilities with general education schools. Rather, MCPS evaluates the facility needs of these schools on a project-by-project basis.<sup>21</sup>

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<sup>19</sup> *Ibid.*, page 4.

<sup>20</sup> *Ibid.*, page. 6.

<sup>21</sup> James Song, May 8, 2015, p. 6.

#### **4. Publication of the 2011 FACT Scores**

MCPS publishes the total FACT score for each assessed school in Appendix F of the approved Educational Facilities Master Plan and CIP. Elementary and middle schools scores are separately listed and ranked in descending order (see page 39 of this report).

Special education and alternative program centers scores are included in the elementary and middle school queues. MCPS does not publish holding school FACT scores.

MCPS provided OLO with the school-specific reports and worksheets from the 2011 FACT assessments. In 2011, MCPS posted the results of the FACT assessments on its website. At present, however, the school-specific FACT results are not available online.

#### **D. Revitalization/Expansion Program: Duration of Queue and Scope of Projects**

This section provides detail about the planned duration of the Revitalization/Expansion program queue and the scope of construction projects developed under the program.

##### **1. Duration of the Revitalization/Expansion Queue**

The MCPS Educational Facilities Master Plan indicates that all schools assessed in 2011 eventually will be reconstructed in the order of their ranking in the Revitalization/Expansion program queue. As stated in Appendix F of the Master Plan:

As the current queue of schools scheduled for Revitalization/Expansion projects is completed, schools [assessed in 2011] will be placed in the Revitalization/Expansion queue according to their score. The movement of the newly assessed schools to the Revitalization/Expansion queue will occur as planning and construction funds are programmed in the six year CIP period.<sup>22</sup>

MCPS has not re-assessed the schools in the Revitalization/Expansion program queue since 2011 nor does the school system plan to reassess the condition of these buildings in the future.

##### **2. Scope of Revitalization/Expansion Projects**

Revitalization/Expansion projects rarely involve mere renovation of an existing structure. Rather, Revitalization/Expansion projects frequently result in complete or near complete reconstruction of school buildings. MCPS has concluded that reconstructing a building to current specifications often costs less than renovating the building to the same specifications. As stated in the Educational Facilities Master Plan:

The cost to revitalize/expand an older school so that it is educationally, technologically, and physically up-to-date, is similar to the cost to construct a new school. In most cases, a life cycle cost analysis shows it is more cost effective to replace an older school facility rather than attempt to salvage portions of the old facility.<sup>23</sup>

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<sup>22</sup> FY16 Educational Facilities Master Plan, page F-1.

<sup>23</sup> *Ibid.*, page 3-6.

The Public School Construction Program (PSCP) for the State of Maryland requires feasibility studies to be submitted for each project that may include abandonment of an existing facility or demolition of more than 50% of an existing structure. This submittal occurs prior to MCPS planning approval and must contain a forty-year life cycle cost comparison of options ranging from renovation to replacement. The analysis must contain the following cost elements for each option:

- Initial construction
- Demolition
- Additional site acquisition
- Temporary student housing and transportation
- Interest on or outstanding bond debt
- Forty-year maintenance costs
- Forty-year energy costs

The renovation costs data incorporates information contained with the feasibility study as it relates to existing conditions of building components. For each component, the design team must evaluate the quality of the original design and construction, the existing condition, and the remaining life expectancy. These components include:

- Primary Structure (foundation, floor(s), roof)
- Building Envelope (walls, windows, doors)
- Secondary Systems (floor finishes, ceiling, interior wall)
- Mechanical Systems (HVAC, plumbing)
- Electrical Systems (base service, fire alarm, exit lighting, security, lighting)
- Electronic Communications (video, voice, data)
- Site Conditions/Utilities (roadways, parking, storm water drainage, sidewalks, playfields & equipment, service access, utilities: water, sewer, electric, telephone)

In addition to components, several facility items must be considered and reviewed for potential cost implications. These include:

- Compliance with accessibility codes
- Compliance with fire and life safety codes
- Compliance with environmental regulations
- Historical significance, as determined by Maryland Historical Trust (MHT)
- Energy use, including embedded energy and sustainability factors
- Placement of students and staff during construction

Appendix A to this report includes an example of how MCPS uses the feasibility study process to determine the scope of a school capital improvements project.

## **CHAPTER III: MCPS POLICIES AND PRACTICES**

This chapter provides an overview of the policies and practices that govern MCPS' capital improvements program, with particular emphasis on the school building Revitalization/Expansion program. The chapter includes two sections:

- Section A. Facility Management Policies and Regulation
- Section B. Educational Facilities Master Plan

### **A. Facility Management Policies and Regulation**

The Board of Education has established facility management guidelines regarding the maintenance, improvement, and eventual replacement of the more than 200 MCPS school buildings. Two Board-approved policy statements and a Superintendent-approved regulation govern school building facility management, including the Revitalization/Expansion program.

#### **1. Policy FKB**

In 2010, the Board amended Policy FKB, *Sustaining and Modernizing Montgomery County Public Schools Facilities*.<sup>1</sup> The stated purpose of the Policy FKB is to “affirm the Board of Education’s commitment to maintain all school facilities in conditions that maximize learning opportunities for every student in the county.” In updating Policy FKB, the Board placed increased emphasis on extending the useful life of school buildings by employing routine facility maintenance measures to defer the need for building revitalization and expansion.

In addition to endorsing routine maintenance protocols, Policy FKB directs MCPS to perform scheduled life-cycle replacements of major building systems (including heating, ventilation and air conditioning systems, roofs, plumbing, information technology systems, and security systems). The Board adopted the policy of systematic life-cycle replacement of building systems to “maintain all school facilities at consistently high operational levels and maximize the life-span of existing physical plant asset.”

Nonetheless, the policy asserts that routine maintenance and replacement of major building systems cannot extend the useful life of a facility indefinitely. The policy assumes that, after time, a school building as originally designed and built will no longer meet MCPS educational and infrastructure management standards. Policy FKB states that:

School facilities, building systems, and equipment all require various and continuing levels of attention to achieve their expected life-cycle. MCPS views facility maintenance as being on a continuum ranging from routine repairs to replacement of building systems to complete modernization<sup>2</sup> of facilities.<sup>3</sup>

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<sup>1</sup> Montgomery County Board of Education Policy FKB, *Sustaining and Modernizing Montgomery County Public Schools Facilities*, December 7, 2010, <https://www.montgomeryschoolsmd.org/departments/policy/pdf/fkb.pdf>

<sup>2</sup> The Board of Education most recently amended Policy FKB in December 2010, before MCPS replaced the term “modernization” with “revitalization/expansion.”

<sup>3</sup> *Ibid.*, page 2.

## **2. Policy FAA**

Policy FAA, *Long-range Educational Facilities Planning*, presents the Board’s strategy for identifying long-term school infrastructure needs.<sup>4</sup> The Board first adopted Policy FAA in April 1986 and most recently amended it in June 2014. The current policy statement cites enrollment trends as a primary factor in school facility planning. According to the policy:

The fundamental goal of facilities planning is to provide a sound educational environment for changing enrollment. The number of students, their geographic distribution, and the demographic characteristics of this population all impact facilities planning.<sup>5</sup>

MCPS prepares two long-range facility planning documents: the six-year Capital Improvements Program (CIP) and the Educational Facilities Master Plan (EFMP). These documents identify MCPS facility construction and improvement projects. Policy FAA indicates that the CIP and EFMP should include “enrollment projections, educational program needs, and available school capacity countywide and identify:

- when new schools and additions will be needed to keep facilities current with enrollment levels and educational program needs;
- funds for systemic maintenance and replacement projects to sustain schools in good condition and extend their useful life;
- a schedule to revitalize/expand older school buildings in order to continue their use on a cost-effective basis, and to keep facilities current with educational program needs;
- when school closures and consolidations are appropriate due to declining enrollment levels; and
- facility utilization levels, capacity calculations, school enrollment size guidelines, and school site size.<sup>6</sup>

Most relevant to this report, the third bullet above requires MCPS to develop a long-term planning schedule for the Revitalization/Expansion program.

## **3. Regulation FAA-RA**

Regulation FAA-RA is the Superintendent-approved implementation plan for the Board of Education Policy FAA.<sup>7</sup> The regulation provides guidance on how MCPS should conduct the long-term facility planning process. The MCPS Superintendent most recently revised FAA-RA in June 2015.

The revised regulation specifies the types of information to be included in the six-year Capital Improvements Program (CIP) and the Educational Facilities Master Plan (EFMP). The regulation calls for the planning documents to include six-year enrollment forecasts for each school as well as long-term (10-to-15 year) forecasts for secondary schools. According to the regulation, enrollment forecasts “are

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<sup>4</sup> Montgomery County Board of Education Policy FAA, *Long-range Educational Facilities Planning*, June 17, 2014, <https://www.montgomeryschoolsmd.org/departments/policy/pdf/fkb.pdf>

<sup>5</sup> *Ibid.*, page 1.

<sup>6</sup> *Ibid.*, page 3.

<sup>7</sup> Montgomery County Public Schools Regulation FAA-RA, *Long-range Educational Facilities Planning*, June 6, 2015, <http://www.montgomeryschoolsmd.org/departments/policy/pdf/faara.final.pdf>

the basis for evaluating school space needs and initiating planning activities.” Regulation FAA-RA further specifies preferred school enrollment ranges and student-to-classroom ratios to be used in evaluating the level of school utilization.<sup>8</sup> As directed by the regulation, MCPS is to annually update enrollment forecasts and school utilization assessments for use in preparation of the Superintendent’s CIP recommendations.

## **B. Educational Facilities Master Plan**

MCPS annually publishes a single document that combines both the approved Educational Facilities Master Plan. The approved FY16 Educational Facilities Master Plan includes two sections that address the Revitalization/ Expansion program.

### **1. Chapter Three, Facility Planning Objectives**

Chapter Three of the approved FY16 Educational Facilities Master Plan presents six objectives that guide the MCPS facility planning process and the development of the CIP. The third objective is titled “Sustaining and Revitalizing Facilities.” This objective opens with the following statement:

The Board of Education, superintendent of schools, and school community recognize the necessity to maintain schools in good condition through a range of activities that includes routine daily maintenance to the systematic replacement of building systems.... The Board of Education, superintendent of schools, and school community also recognize that even well-maintained facilities eventually reach the end of their useful life span and require revitalization. Revitalization/Expansion projects update school facilities and provide the variety of instructional spaces necessary to effectively deliver the current curriculum.<sup>9</sup>

Chapter Three outlines the method for assessing the condition of school buildings and determining which warrant inclusion in the Revitalization/Expansion program. MCPS employs a scoring system called the “Facilities Assessment with Criteria and Testing (FACT)” to evaluate the condition of older school buildings. The FACT methodology assigns scores based on a series of educational program and physical infrastructure criteria.

### **2. Appendix F**

Appendix F of the approved FY16 Educational Facilities Master Plan summarizes MCPS’ system for assessing schools for inclusion in the Revitalization/Expansion program. The document states that “while a primary factor in the need to revitalize a school is the age of the facility, a number of other factors also are considered in assessing the condition of a school.” As described in Appendix F, the other factors include “educational program” parameters (i.e. open plan schools, and controlled access) and “physical infrastructure” parameters (facility design, utility and energy efficiency, and maintenance costs). The FACT methodology assigns scoring for each specification as detailed in Chapter VI of this report.

The Educational Facilities Master Plan also includes a schedule of planned Revitalization/Expansion projects. The Revitalization/Expansion program queue appears in Chapter VI of this report. The order of schools in the queue correspond to the rankings in the FACT assessments; the queue is intended to remain unchanged until each school on the list is reconstructed or otherwise improved.

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<sup>8</sup> The term “school utilization” refers to whether a school building is at, over, or under capacity.

<sup>9</sup> FY16 Educational Facilities Master Plan, page 3-6.

## **CHAPTER IV: CAPITAL IMPROVEMENT EXPENDITURES**

This chapter presents information about the expenditures programmed in the Capital Improvements Program (CIP) for MCPS Revitalization/Expansion projects as well as building system improvements to extend the useful life of school buildings. The chapter includes four sections:

- Section A. Overview of MCPS Capital Improvements Program
- Section B. Revitalization/Expansion Program Expenditures
- Section C. Projects to Extend the Useful Life of School Buildings
- Section D. Expenditures on Revitalization/Expansion versus Extending the Useful Life of Buildings

### **A. Overview of MCPS Capital Improvements Program**

Over the past five years, the approved Capital Improvements Program (CIP), including Council-approved FY16 amendments, budgeted \$1,269 million in capital improvements for MCPS facilities. For the purpose of this report, OLO divided the MCPS CIP into four categories:

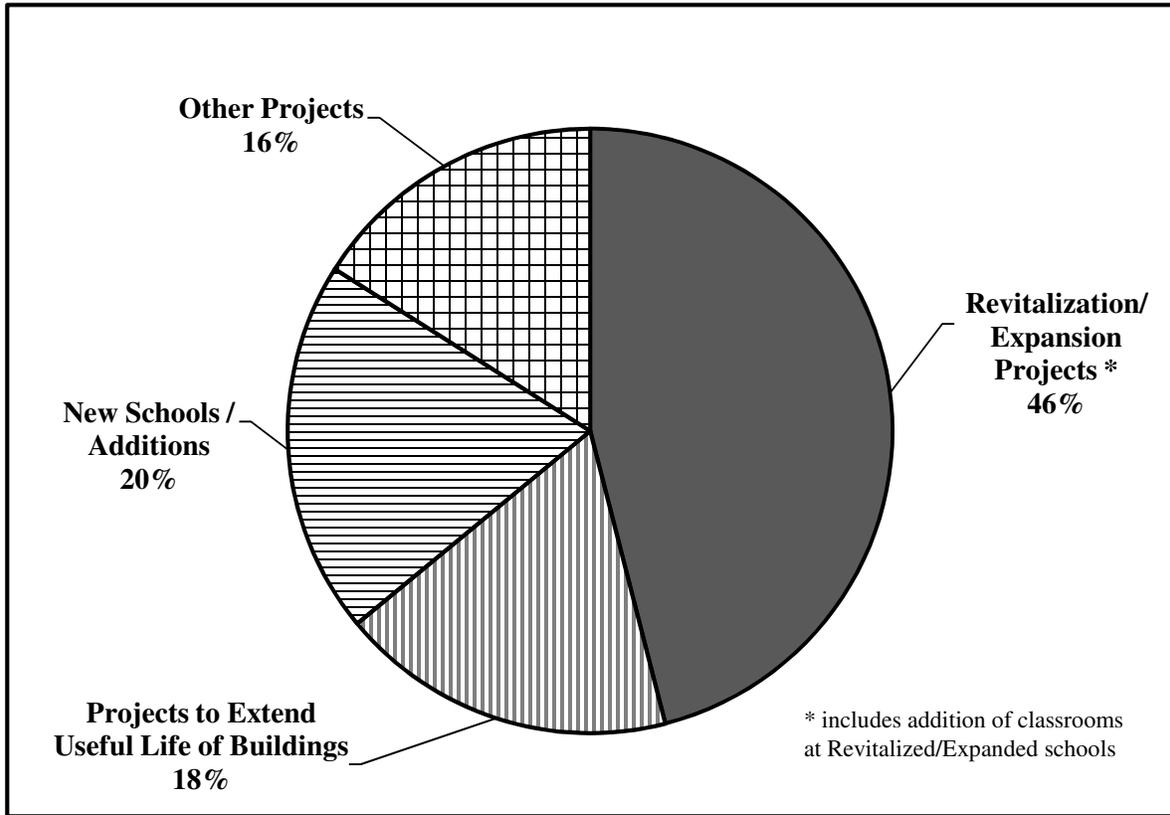
- Revitalization/Expansion: Spending to replace schools through the Revitalization/Expansion program. As discussed below, the MCPS Revitalization/Expansion capital projects frequently include expansion of building space, and therefore also address school capacity needs.
- Projects to Extend the Useful Life of School Buildings: Aggregate spending on 11 MCPS capital projects as described Section C of this chapter.
- New Schools and Additions: Projects to construct new schools or to build additions to existing school buildings.
- Other Projects: Other MCPS CIP projects including Technology Modernization, Relocatable Classrooms, and Facility Planning.

The pie chart on the next page shows the allocation of MCPS capital expenditures (from all revenue sources) combined for the five year period of FY12 through FY16. As shown in the table, Revitalization/Expansion projects, by far, comprise the largest portion of MCPS capital spending. For FY12 through FY16, Revitalization/Expansion expenditures totaled \$578.2 million<sup>1</sup> or nearly half of total MCPS capital expenditures. During this five-year period, MCPS spent more than twice as much on Revitalization/Expansion of existing schools than on individual projects to construct new schools and build additions.

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<sup>1</sup> This total reflects the costs for the Current Revitalizations/Expansions CIP project (#P926575).

Allocation of MCPS Capital Expenditures, FY12-FY16



Source: Office of Management and Budget, Annual Approved Capital Improvement Program, Form CIP230

**B. Revitalization/Expansion Program Expenditures**

The Council-approved CIP includes two projects to fund Revitalization/Expansion improvements.

**1. Current Revitalizations/Expansions Capital Project**

Funding for active MCPS Revitalization/Expansion improvements is included in a single CIP project called “Current Revitalizations/Expansions” (Project #P926575). As detailed in Chapter II, the scope of work for Revitalization/Expansion projects often involves complete or near complete reconstruction of school buildings. When a school undergoes improvements through the Revitalization/Expansion program, the capital project frequently includes the addition of classrooms and other space to accommodate projected enrollment. The 16 projects (ten elementary, three middle, and three high schools) completed between FY11 and FY16 produced a total of a 152 additional classrooms. In addition, reconstruction projects provide a school with new building systems replacing substandard systems that may have existed in the previous structure.

In recent years, approved funding for this CIP project has been sufficient for work to proceed on three to six school reconstruction projects at a time. In addition, the limited availability of holding schools also constrains the number of concurrent school reconstructions.

The sequencing of Revitalization/Expansion queue is determined by the FACT assessment process described in Chapter II. At present, the Current Revitalizations/Expansions CIP project funds planning, design, and construction work for the last schools assessed in the 1990s. In upcoming years, work will begin on schools at the top of the Revitalization/Expansion queue determined by the 2011 FACT assessments. The full list of schools in the Revitalization/Expansion queue appears in Chapter VI of this report.

The approved CIP (as amended by the Council in May 2015) includes \$120.7 million of expenditures for the Revitalization/Expansion CIP project. General obligation (GO) bonds provide nearly all of FY16 funding for this project. As shown in the table below, the CIP assumes between \$104.3 million and \$132.4 million annually for project expenditures during the five-year period from FY16 through FY20. In the out years, project funding will be supplemented by current revenue (general tax revenue as well as recordation tax revenue) and developer contributions (from impact taxes and schools facilities payments).

**Current Revitalizations/Expansions CIP Project  
Planned Expenditures by Funding Source, FY16 through FY20**

Funding Source	FY16	FY17	FY18	FY19	FY20
General Obligation Bonds	\$118,532,000	\$90,698,000	\$80,306,000	\$81,315,000	\$61,388,000
Current Revenue: General / Recordation Tax	\$1,984,000	\$23,091,000	\$23,994,000	\$27,698,000	\$30,213,000
Impact Tax / Schools Facilities Payments	\$138,000	\$0	\$0	\$23,422,000	\$23,003,000
<b>TOTAL</b>	<b>\$120,654,000</b>	<b>\$113,789,000</b>	<b>\$104,300,000</b>	<b>\$132,435,000</b>	<b>\$114,604,000</b>

Source: Office of Management and Budget, FY16 Approved Amendments to the FY 15-20 Capital Improvement Program

Over the next five years, the average annual budgeted level of expenditures for the Revitalization/Expansion CIP project is about \$117 million per year. By comparison, the current cost to construct a new MCPS elementary school is about \$30 million and the cost to construct a new MCPS middle school is about \$52 million. Therefore, the annual spending rate for the program is about equivalent to the costs of constructing two new elementary schools and one new middle school each year.

**2. Future Revitalization/Expansion Capital Project**

The CIP includes a second project to fund the MCPS Revitalization/Expansion program. The “Future Revitalizations/Expansions” project (Project #P886536) programs expenditures for future school Revitalization/Expansion projects. As MCPS completes feasibility studies and architectural planning, funding for capital improvements moves from this project to the Current Revitalization/Expansion project. In the current CIP, this project includes programmed dollars beginning in FY18.

**Future Revitalizations/Expansions CIP Project  
Planned Expenditures, FY16 through FY20**

Funding Source	FY16	FY17	FY18	FY19	FY20
General Obligation Bonds	\$0	\$0	\$3,368,000	\$5,532,000	\$24,240,000

Source: Office of Management and Budget, FY16 Approved Amendments to the FY 15-20 Capital Improvement Program

General obligation bonds are the sole funding source for this project. The CIP includes \$3.4 million of programmed expenditures in FY18 growing to \$24.2 million in FY20. The combined programmed FY15 – FY20 CIP expenditures for the Current and Future Revitalization/Expansion capital projects total to \$618.9 million, or about \$123.8 million per year.

### **C. Projects to Extend the Useful Life of School Buildings**

As mentioned in the previous chapter, MCPS stated policy is to invest in facility upkeep and systematic life-cycle replacement of major building systems in order to maximize the useful life of school buildings. The MCPS Educational Facilities Master Plan states that “by providing a higher level of maintenance at schools, facilities will be in good condition for a longer period of time.”<sup>2</sup> MCPS asserts that schools built or revitalized in the past 30 years “are generally of higher construction quality than schools built prior to 1985” and that “it is possible to extend the useful life through a high level of maintenance and replacement of building systems.”<sup>3</sup>

The County CIP includes at least eleven projects upgrade school buildings and to replace school building systems. These capital projects serve to extend the useful life of MCPS facilities.

<b>ADA Compliance</b>	A number of existing MCPS facilities are at least partially inaccessible for a variety of disabling conditions. This project funds the installation of elevators, wheelchair lifts, restroom modifications, automatic door openers, access ramps, and curb cuts and other site-specific improvements to bring school buildings into compliance with the requirements of the Federal Americans with Disabilities Act (ADA).
<b>Asbestos Abatement</b>	This project funds asbestos management services in MCPS facilities in accordance with the Federal Asbestos Hazard Emergency Response Act (AHERA).
<b>Building Modifications and Program Improvements</b>	This project provides limited facility modifications to support program offerings at schools that are not scheduled for Revitalization/Expansion. Improvements funded by this project include modifications to provide adequate space for new instructional programs and administrative support.
<b>Energy Conservation</b>	The MCPS Energy Conservation Program is intended to reduce energy consumption in school buildings. This project funds implementation of the Energy Conservation Program by improving building mechanical systems, retrofitting building lighting and control systems, and controlling HVAC equipment through computer management systems.
<b>Fire Safety Code Upgrades</b>	This project provides funding to install sprinklers, escape windows, exit signs, fire alarm devices, exit stairs, and hood and fire suppression systems as necessary to comply with the County’s fire code.

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<sup>2</sup> FY16 Educational Facilities Master Plan, page 3-7.

<sup>3</sup> *Ibid.*, page 3-6.

<b>HVAC (Mechanical Systems) Replacement</b>	This project funds the systematic replacement of heating, ventilating, air conditioning, automated temperature controls, and plumbing systems.
<b>Improved (Safe) Access to Schools</b>	This project funds vehicular and pedestrian access improvements at schools. Improvements include road widening and adding or modifying entrance and exits to schools.
<b>Indoor Air Quality Improvements</b>	This project funds mechanical retrofits and building envelope modifications necessary to correct indoor air quality problems in MCPS facilities. Remediation efforts include carpet removal, floor and ceiling tile replacement, and minor mechanical retrofits.
<b>Planned Life Cycle Asset Replacement</b>	The Planned Life Cycle Asset Replacement (PLAR) program is intended to provide for scheduled replacement of facility equipment and site features based on their age and condition. This project funds PLAR activities including code corrections, physical education facility improvements, exterior resurfacing, and replacement of doors, lighting, communication systems, and flooring.
<b>Restroom Renovations</b>	This project provides funding for renovation of restroom plumbing fixtures, accessories, and room finishes in buildings that were built or renovated before 1985 (excluding schools with Revitalization/Expansion planning of construction funding in the six-year CIP).
<b>Roof Replacement</b>	School building roofs have an expected life of 20 years. This project funds the planned replacement of roofs that have reached the end of their expected useful life.

As shown in the table on the following page, these eleven CIP projects have combined programmed FY16 capital expenditures of \$49.8 million. The funding source for all of the programmed expenditures is County general obligation bonds. The largest project, by far, is HVAC (Mechanical Systems) Replacement with a FY16 appropriation of \$16.0 million, an amount equal to nearly one-third of the combined total for the eleven projects.

In past years, the State of Maryland has contributed to some of these capital projects, most notably the HVAC Replacement project. In FY15, the State contributed \$7.6 million to support replacement of HVAC systems in MCPS buildings. As the amount of future State support for these projects is unknown, the CIP shows no State Aid in FY16 and beyond.

**Capital Improvement Projects to Extend the Useful Life of MCPS Buildings  
(FY16 Capital Budget Expenditure Amounts)**

CIP Project Name (Project Number)	County GO Bonds
ADA Compliance (P796235)	\$3,000,000
Asbestos Abatement (P816695)	\$1,145,000
Building Modifications and Program Improvements (P076506)	\$3,500,000
Energy Conservation (P796222)	\$2,057,000
Fire Safety Code Upgrades (P016532)	\$2,000,000
HVAC (Mechanical Systems) Replacement (P816633)	\$16,000,000
Improved (Safe) Access to Schools (P975051)	\$1,200,000
Indoor Air Quality Improvements (P006503)	\$2,147,000
Planned Life Cycle Asset Replacement (P896586)	\$9,750,000
Restroom Renovations (P056501)	\$1,000,000
Roof Replacement (P766995)	\$8,000,000
<b>TOTAL</b>	<b>\$49,799,000</b>

Source: Office of Management and Budget, FY16 Approved Amendments to the FY 15-20 Capital Improvement Program

The Educational Facilities Master Plan indicates that MCPS intends to make facility upkeep and building systems replacement projects a funding priority in future years. The Master Plan states that “in the coming years, more funds will be directed to capital projects that sustain facilities in good condition for longer periods than have been feasible in the past.”<sup>4</sup> However, the current Council-approved approved CIP does not reflect the Master Plan policy. The table on the next page displays the aggregate planned spending for the 11 capital projects listed above for each of the next five years. The data show that expenditures for these 11 projects are planned to fall from \$49.8 million in FY16 to \$34.6 million in FY20, a 30% decrease.

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<sup>4</sup> *Ibid.*, page 3-6.

**Capital Improvement Projects Related to Upkeep and Maintenance of MCPS Buildings  
Aggregate Planned Expenditures, FY16 through FY20 <sup>5</sup>**

Funding Source	FY16	FY17	FY18	FY19	FY20
General Obligation Bonds	\$49,799,000	\$35,625,000	\$34,975,000	\$34,625,000	\$34,625,000

Source: Office of Management and Budget, FY16 Approved Amendments to the FY 15-20 Capital Improvement Program

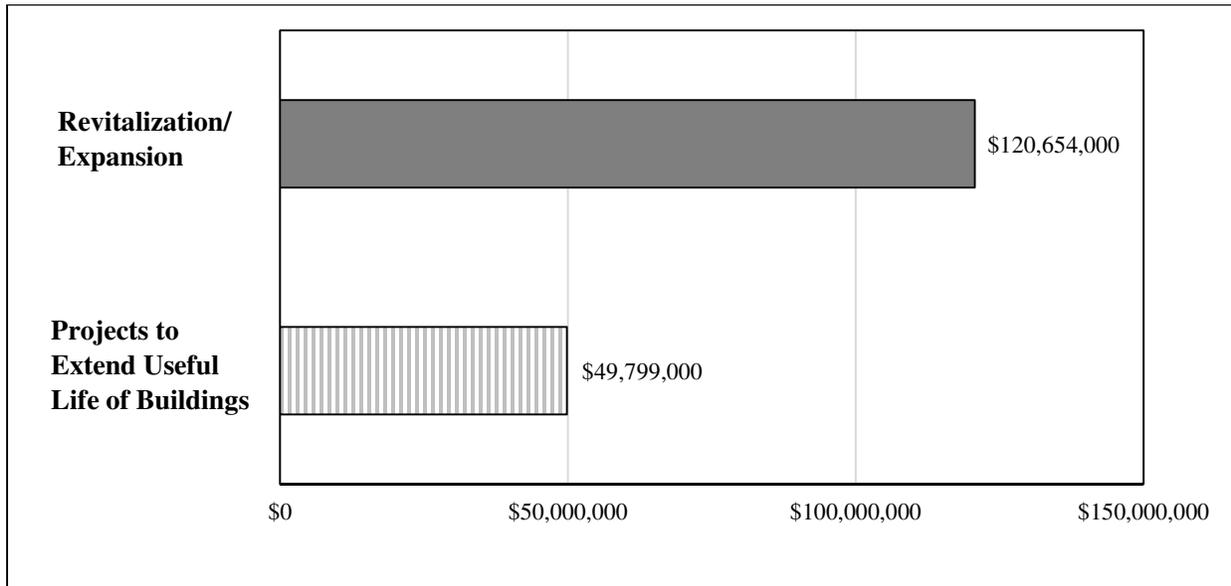
**D. Expenditures on Revitalization/Expansion versus Extending the Useful Life of Buildings**

This section compares planned spending on Revitalization/Expansion projects with planned spending on capital projects to increase the useful life of school buildings.

**1. FY16 CIP Expenditures**

The FY16 approved CIP includes \$120.7 million for the Current Revitalization/Expansion capital project. In contrast, approved FY16 expenditures for the eleven CIP projects to extend the useful life of MCPS buildings total \$49.8 million. As such, the CIP assumes that MCPS will spend about two-and-a-half times as much in FY16 for Revitalization/Expansion than it will spend for upgrades and improvements to major school building systems. In other words, of total FY16 capital expenditures on existing school structures (excluding additions), about 71% of the dollars are intended to be spent on a relatively small number of Revitalization/Expansion projects while the remaining 29% would be spent on building system upgrades for schools Countywide.

**Comparison of FY16 Capital Expenditures  
Revitalization/Expansion Projects versus  
Projects to Extend the Useful Life of School Buildings**

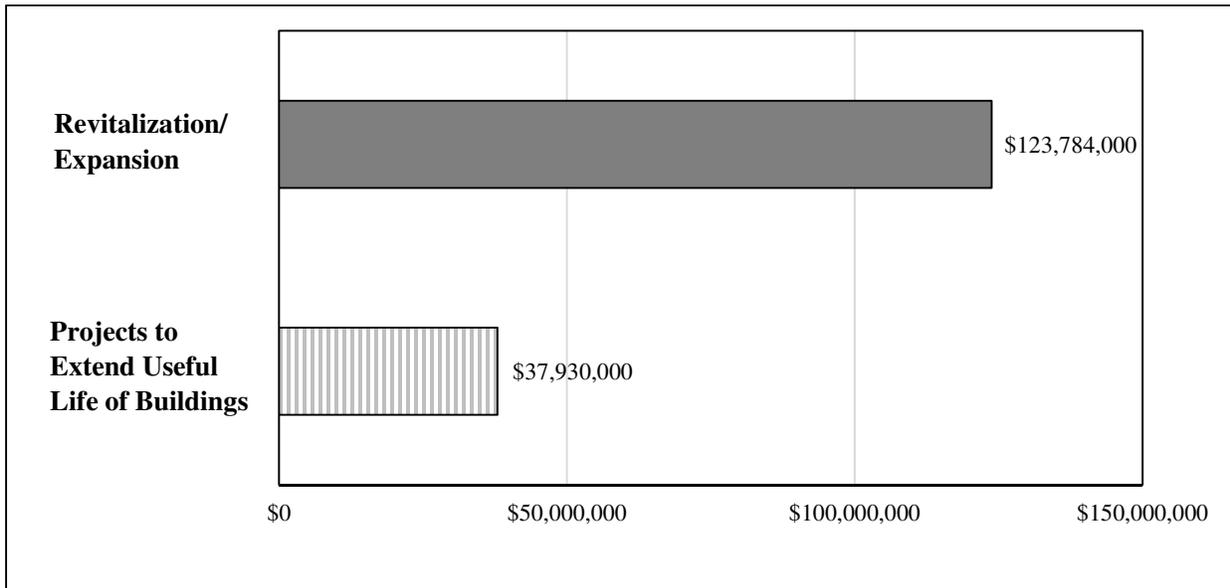


<sup>5</sup> The CIP shows no planned out-year expenditures for the Building Modifications and Program Improvements and the Improved (Safe) Access to Schools projects. Historically, programmed expenditures are added to these two projects during the bi-annual CIP approval process. To account for the likelihood that the CIP will include future funding of these projects, the totals in this table assume continued expenditures for these projects at the FY16 level.

## 2. Planned FY16-FY20 Expenditures

As mentioned on page 18, the CIP includes an average of \$123.8 million per year in FY16 – FY20 capital expenditures for the two MCPS Revitalization/Expansion capital projects combined. Average annual planned expenditures for projects to extend the useful life of school buildings total \$37.9 million. Thus, the CIP assumes that MCPS will spend more than three times as much per year for Revitalization/Expansion projects than it will spend for upgrades and improvements to major building systems.

**Comparison of Planned FY16-FY20 Average Annual Capital Expenditures  
Revitalization/Expansion Projects versus  
Projects to Extend the Useful Life of School Buildings**



## **CHAPTER V: AGE AND LOCATION OF SCHOOL BUILDINGS AND MODERNIZATIONS**

This chapter presents data and analysis regarding the age of MCPS schools as well as the location and building age of modernizations projects. The chapter includes seven sections:

- Section A. Source Data and Methodology
- Section B. Age and Location of School Buildings
- Section C. Current Age of School Buildings
- Section D. School Modernizations: Geographic Distribution of Projects and Age at Completion
- Section E. FACT 2011 Assessed Schools and Future Outlook
- Section F. Special Program and Holding Schools
- Section G. OLO Observations Regarding Building Age and Modernizations

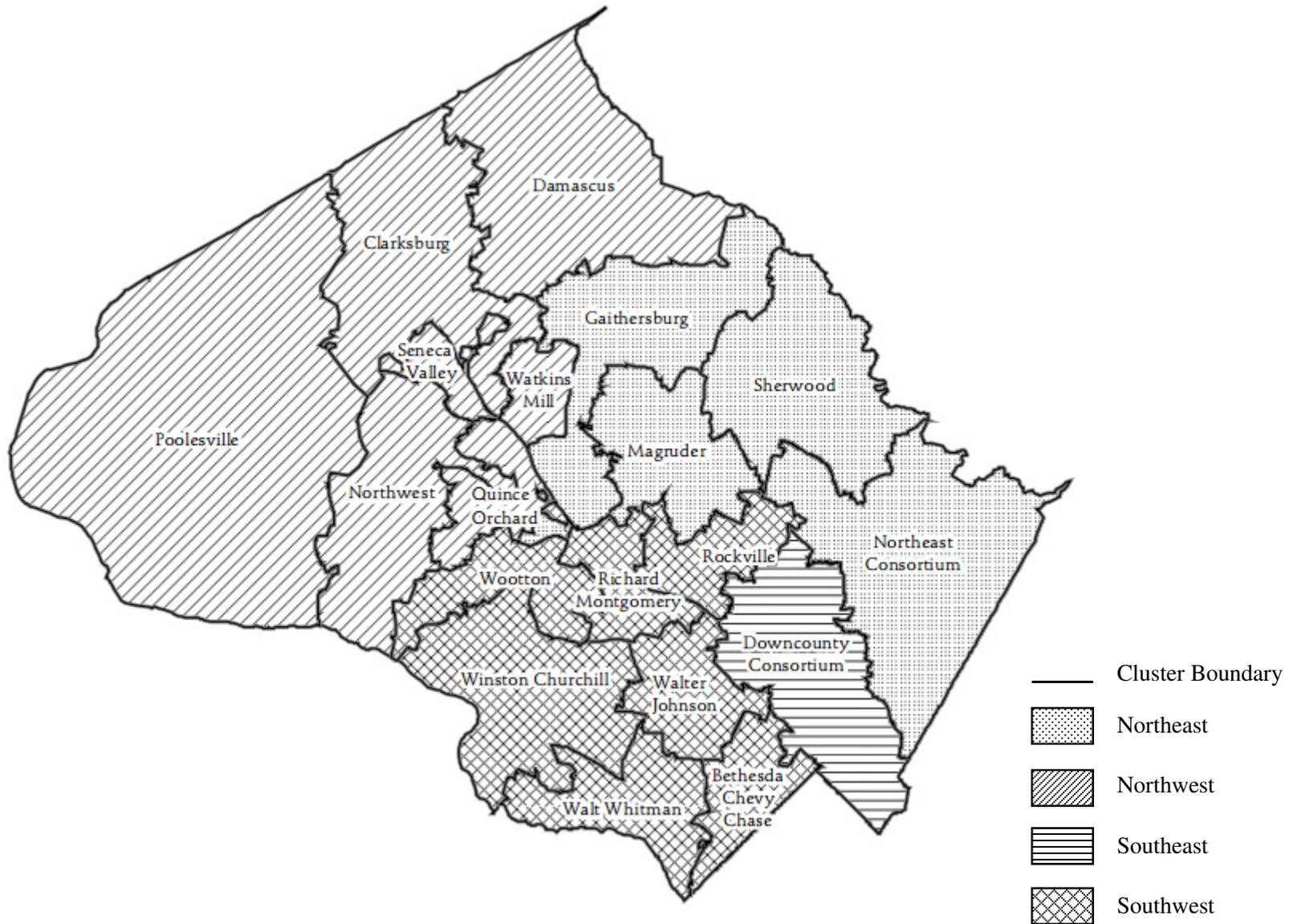
### **A. Source Data and Methodology**

For data on individual schools and Revitalization/ Expansion schedule, OLO staff relied on data included in the approved FY16 Educational Facilities Master Plan. For this chapter, OLO divided elementary, middle, and high schools into four geographic regions of the County known as “Quad Clusters” as defined by MCPS in the FY16 Educational Facilities Master CIP.

A map of the MCPS Quad Clusters appears on the following page. OLO staff named Quad Clusters by their relative geographic location in the County:

- Northeast;
- Northwest;
- Downcounty Consortium; and
- Southwest.

The programmatic and design needs of career and technology, alternative education, special education, and holding schools differ from those of other MCPS schools. Therefore, OLO did not include these schools in the Quad Cluster analysis. Rather, OLO conducted a separate analysis of the age and modernization history of these schools. (See Section F of this chapter).



**B. Age and Location of School Buildings**

At present, the MCPS system includes 196 elementary, middle, and high schools.<sup>1</sup> The total number of schools are distributed fairly evenly across the four Quad Clusters.

**Total Number of Schools by Quad Cluster and Category**

Quad Cluster	Total Number of Schools	Total Number by Category		
		Elementary	Middle	High
Northeast	49	33	10	6
Northwest	50	33	10	7
Downcounty Consortium	43	29	9	5
Southwest	54	38	9	7
<b>MCPS</b>	196	133	38	25

**1. Age of School Buildings**

In 1999, The U.S. Department of Education, National Center for Education Statistics (NCES) published an Issue Brief analyzing the age of America’s public schools and age at the time of major school renovations.<sup>2</sup> NCES utilized the Fast Response Survey System (FRSS) to query U.S. public school administrators about the age of their school buildings and date of last renovation. NCES grouped school construction dates into four time periods: before 1950, 1950-1969, 1970-1984, and after 1985. OLO staff utilized these time periods to understand school construction trends in the County.

**Year of MCPS School Construction (Percent of Schools)**

	Year of Schools Construction (% of Schools)			
	Before 1950	1950 - 1969	1970 -1984	After 1985
United States	28.0%	45.0%	17.0%	10.0%
MCPS	8.7%	54.6%	13.8%	23.0%

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<sup>1</sup> This total does not include closed schools, holding schools, and special/alternative education centers.

<sup>2</sup> National Center for Education Statistics, “How Old are America’s Public Schools?” U.S. Department of Education, Office of Education Research and Improvement, January 1999.

The majority of MCPS schools (107 schools out of 196 or 54.6%) were constructed between 1950 and 1969, corresponding to the years during which the Baby Boom generation was going to school. For three out of the four MCPS Quad Clusters, most new school construction occurred in the period between 1950 and 1969:

- Northeast, 53% of schools built 1950-1969;
- Downcounty Consortium, 67% built 1950-1969;
- Southwest, 76% built 1950-1969.

Nearly a quarter of MCPS schools (23%) were constructed since 1985. New school construction is concentrated in the Northwest Quad Cluster with 54% of these schools constructed after 1985.

#### New School Construction by Quad Cluster

Quad Cluster	Median Year Built	No. of Schools	Before 1950		1950 - 1969		1970 - 1984		After 1985	
			Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent
Northeast	1968	49	1	2.0%	26	53.1%	8	16.3%	14	28.6%
Northwest	1987	50	2	4.0%	11	22.0%	10	20.0%	27	54.0%
Downcounty Consortium	1956	43	7	16.3%	29	67.4%	4	9.3%	3	7.0%
Southwest	1962	54	7	13.0%	41	75.9%	5	9.3%	1	1.9%
<b>MCPS</b>	1966	196	17	8.7%	107	54.6%	27	13.8%	45	23.0%

## 2. Modernizations

To date, MCPS has completed a total of 110 modernizations of elementary, middle, and high schools (56.1% of all schools).<sup>3</sup> The number of modernizations in each Quad Clusters generally correspond to the age of the schools. Areas of the County that experienced the highest rate of school construction growth in 1950 through 1969 have also experienced the highest number of modernization projects. For example, the Southwest Quad Cluster has the highest percent of schools constructed in 1950-1969 (75.9%) and the highest number of schools modernized (79.6%). By comparison, the Northwest Quad Cluster had 54% of schools constructed after 1985 and the lowest number of schools modernized (22%).

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<sup>3</sup> For total number of schools modernized since 1985, see Chapter 3 of the MCPS Educational Facilities Master Plan and Capital Improvements Program.

**Number of Schools Modernized by Quad Cluster (Through June 2015)**

<b>Quad Cluster</b>	<b>Total Number of Schools</b>	<b>Number of Schools Modernized</b>	<b>Percent of Total</b>
Northeast	49	25	51.0%
Northwest	50	11	22.0%
Downcounty Consortium	43	31	72.1%
Southwest	54	43	79.6%
<b>MCPS</b>	<b>196</b>	<b>110</b>	<b>56.1%</b>

**3. Reopened Schools**

MCPS has reopened a total of 16 previously closed schools – four in the Northeast Quad Cluster; one in the Northwest; eight in the Downcounty Consortium; and three in the Southwest. Of these 16 schools, a total of ten schools were reopened by MCPS, but not fully modernized.<sup>4</sup> The Downcounty Consortium has the greatest concentration of these buildings with five schools in this Quad Cluster reopened but not modernized.

**Number of Schools Reopened but Not Modernized**

<b>Quad Cluster</b>	<b>Total Number of Reopened</b>	<b>Reopened but Not Modernized</b>	<b>Percent of Total</b>
Northeast	4	2	50.0%
Northwest	1	1	100.0%
Downcounty Consortium	8	5	62.5%
Southwest	3	2	66.7%
<b>MCPS</b>	<b>16</b>	<b>10</b>	<b>62.5%</b>

Middle schools comprise the largest category of reopened but not modernized schools. Of the eight reopened middle schools, six were not modernized. Neither of the two reopened high schools (Clarksburg and Northwood) were modernized.

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<sup>4</sup> FY15 Educational Facilities Master Plan and FY15-FY20 Capital Improvements Program Appendix K, Reopened Schools.

**Reopened Schools by Quad Cluster and Category**

Quad Cluster	Elementary		Middle		High	
	Reopened	Modernized	Reopened	Modernized	Reopened	Modernized
Northeast	3	1	1	1	--	--
Northwest	--	--	--	--	1	--
Downcounty Consortium	3	3	4	--	1	--
Southwest	--	--	3	1	--	--
<b>MCPS</b>	6	4	8	2	2	--

**C. Current Age of School Buildings**

This section presents information about the current age of MCPS elementary, middle, and high schools. (Information about the current age of special program and holding schools appears in Section F of this chapter.)

**1. Current Age**

To calculate the average age of a school building, OLO staff relied on information included in Chapter Four of approved FY15 Educational Facilities Master Plan. This data source provides the year the facility opened and the Revitalization/ Expansion date for each school. OLO supplemented the data in Chapter Four with information in Appendix K of the same document. For the purposes of this report, OLO staff calculated current age as:

Current Age = Current Calendar Year – Year the Facility Originally Opened *OR* completed Revitalization/ Expansion

OLO staff used the most recent date listed in the FY15 Educational Facilities Master Plan for the date of completed Revitalization/ Expansion. For schools that were reopened, but not fully modernized, OLO staff used the original year the school opened as the basis for the age calculation.

The average age of MCPS schools (elementary, middle, and high) is 25.1 years. Building modernizations have lowered the average age of school buildings, particularly in Quad Clusters with the oldest school construction dates. However, the number of reopened but not modernized schools impacts the average age of school buildings in each Quad Cluster.

**Average Age in Years of School Buildings by Quad Cluster**

Quad Cluster	Average Age of School Buildings		
	Elementary	Middle	High
Northeast	<u>26.1</u>	26.6	18.7
Northwest	28.6	22.9	<u>29.3</u>
Downcounty Consortium	21.9	<u>41.9</u>	<u>28.4</u>
Southwest	20.9	<u>25.8</u>	17.3
<b>MCPS</b>	24.7	29.1	23.2

Note: Underlined average ages indicate that data include at least one school that was reopened but not modernized.

**2. Effect of Reopened but not Modernized Schools on Average Age**

Schools that were reopened but not modernized affect the average age of schools in three out of the four Quad Clusters. These three Quad Clusters experience a higher average age compared to their counterparts within the same school category (elementary, middle, and high).

- **Elementary Schools.** The Northeast Quad Cluster includes two elementary schools that were reopened but not modernized. Excluding these schools from the calculation reduces the average age of elementary schools in this Quad Cluster from 26.1 years to 24.5 years, a change of 1.6 years.
- **Middle Schools.** Both the Downcounty Consortium and the Southwest Quad Clusters include middle schools that were reopened but not modernized. The four schools of this type in the Downcounty affect the average middle school age in the Quad Cluster by 20 years. The presence of reopened but not modernized middle schools in the Southwest Quad Cluster add 7.6 years to the average school age in this region of the County.
- **High Schools.** Northwood High School, a reopened but not modernized school in the Downcounty Consortium, affects the average high school age in this Quad Cluster by 9.6 years.<sup>5</sup>

<sup>5</sup> The Clarksburg High School building was constructed in 1995 as Rocky Hill Middle School. The middle school closed in 2004 and reopened as a high school in 2006. At the guidance of MCPS staff, OLO considered 1995 as the opening date of the high school. This assumption did not change the average age of high schools in the Northwest Quad Cluster.

**Effect of Reopened but not Modernized Schools on Average Age of School Buildings**

Quad Cluster	Elementary			Middle			High		
	All Schools	Excluding Reopened but not Modernized Schools	Difference	All Schools	Excluding Reopened but not Modernized Schools	Difference	All Schools	Excluding Reopened but not Modernized Schools	Difference
Northeast	26.1	24.5	-1.6	26.6	26.6	--	18.7	18.7	--
Northwest	28.6	28.6	--	22.9	22.9	--	29.3	29.3	--
Downcounty Consortium	21.9	21.9	--	41.9	21.9	-20.0	28.4	18.8	-9.6
Southwest	20.9	20.9	--	25.8	18.2	-7.6	17.3	17.3	--
<b>MCPS</b>	24.7	24.3	-0.4	29.1	22.5	-6.5	23.2	22.5	-0.7

**D. School Modernizations: Geographic Distribution of Projects and Age at Completion**

OLO staff analyzed when school modernizations occurred, where they occurred, and the average age at which a school was modernized. For this analysis, OLO divided the history of MCPS school modernized projects into five time periods:

- **Before 1993:** Includes all schools modernized before 1993, prior to the development of the Facilities Assessment with Criteria and Testing (FACT) assessments.
- **1993 through 2000:** Includes schools modernized from 1993 through 2000 resulting from FACT assessments conducted in 1993 and 1996.
- **2000 through 2010:** Includes schools modernized from 2000 through 2010 resulting from the FACT assessments conducted in 1993, 1996, and 1999.
- **2011 through 2015:** Includes schools modernized from 2011 through 2015 resulting from the FACT assessments conducted in 1993, 1996, and 1999.
- **Programmed 2016-2023:** Includes schools identified in Appendix E of the approved Educational Facilities Master Plan for modernization in 2016 through 2023 including the last schools assessed in the 1990s as well as the first schools assessed as part of the 2011 FACT process.

**1. School Modernizations by Quad Cluster and Across Time**

The most active period for MCPS school modernization activity occurred from 1993 through 2000. During this eight year time period, MCPS modernized 33 schools, a rate greater than four schools per year. The majority of the modernizations from 1993 through 2000 occurred in the Downcounty Consortium and Southwest Quad Clusters, the regions with the oldest school buildings.

In 2001 through 2010 and again in 2011 through 2015, the rate of school modernizations slowed. During these years, MCPS modernized an average of about two-and-a-half schools per year. Again, the majority of the modernizations occurred in the two southern Quad Clusters.

**School Modernizations by Time Period and Quad Cluster**

<b>Quad Cluster</b>	<b>Total Schools Modernized</b>	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016 – 2023</b>
Northeast	29	7	8	6	4	4
Northwest	15	9	1	1	0	4
Downcounty Consortium	34	12	12	4	3	3
Southwest	53	10	12	14	7	10
<b>MCPS</b>	<b>131</b>	<b>38</b>	<b>33</b>	<b>25</b>	<b>14</b>	<b>21</b>

The approved CIP assumes that MCPS will complete an additional 21 Revitalization/Expansion projects from 2016 through 2023. The programmed project rate remains at about two-and-a-half schools per year. Nearly half of the programmed projects are located in the Southwest Quad Cluster. Most of the programmed Southwest Quad Cluster schools were built prior to 1970 and were assessed for modernization prior to 2011. As detailed in Section E of this chapter, the majority of schools assessed in 2011 and in the current Revitalization/ Expansion queue are located in the two northern Quad Clusters.

**2. Average School Building Age at Time of Modernization**

Using data contained in Chapter Four and Appendix E of the approved Educational Facilities Master Plan, OLO compiled information about the age of schools at the time of modernization.<sup>6</sup> As presented below, OLO calculated the average age of schools at modernization by time period and by Quad Cluster.

Countywide: For MCPS overall, the average age at which a modernization occurred has steadily increased over the past two decades. For all school modernizations before 1993, the buildings were an average age of 32.5 years when modernized. The average age rose to 38.3 years for schools modernized from 1993 through 2000; 46.0 years for schools modernized 2001 through 2010; and 51.0 years for schools modernized 2011 through 2015.

As planned in the CIP, the 21 schools programmed in the Revitalization/Expansion CIP projects for 2016 through 2023 will have an average age of 46.2 years when completed. In recent years, the Council has delayed the programmed Revitalization/Expansion schedule because of funding constraints. Changes in the planned schedule for 2016 through 2023 projects would alter the average age.

**Average Age of Schools at Time of Modernization – Countywide**

	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016 – 2023</b>
<b>MCPS</b>	<b>32.5</b> (38 Schools)	<b>38.3</b> (33 Schools)	<b>46.0</b> (25 Schools)	<b>51.0</b> (14 Schools)	<b>46.2</b> (21 Schools)

Northeast: As with the County as a whole, the Northeast Quad Cluster exhibited a steady increase in the age of schools at date of modernization through 2015. On average, schools in this Quad Cluster were younger at modernization than the Countywide average. Looking forward, the four Northeast Quad Cluster schools programmed for modernization in 2016 through 2023 are currently planned to have an average of 49.3 years, the identical average age as for the 2011 through 2015 time period.

**Average Age of Schools at Time of Modernization – Northeast Quad Cluster**

	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016 – 2023</b>
<b>Northeast Quad Cluster</b>	<b>29.6</b> (7 Schools)	<b>30.5</b> (8 Schools)	<b>43.7</b> (6 Schools)	<b>49.3</b> (4 Schools)	<b>49.3</b> (4 Schools)

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<sup>6</sup> OLO calculated the age of a building at modernization from the year that the project was completed.

**Northwest:** Only two Northwest Quad Cluster schools were modernized between 1993 and 2015, an insufficient total to identify long-term trends in average age. The four Northwest Quad Cluster schools programmed for modernization in 2016 through 2023 are currently planned to have an average age of 45.5 years, nearly the same age as the Countywide average.

**Average Age of Schools at Time of Modernization – Northwest Quad Cluster**

	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016 – 2023</b>
<b>Northwest Quad Cluster</b>	<b>29.3</b> (9 Schools)	<b>41.0</b> (1 School)	<b>35.0</b> (1 School)	<b>0</b> (0 Schools)	<b>45.5</b> (4 Schools)

**Downcounty Consortium:** Similar to the Countywide trend, the average age at modernization in the Downcounty Consortium has risen progressively over the past three decades. As programmed in the CIP, this Quad Cluster will experience a large drop in average school age for modernizations programmed for 2016 through 2023. The three Downcounty schools programmed for modernization in 2016 through 2023 are currently planned to have an average age of 40.3 years, nearly six years younger than the Countywide average.

**Average Age of Schools at Time of Modernization – Downcounty Consortium**

	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016 – 2023</b>
<b>Downcounty Consortium</b>	<b>35.3</b> (12 Schools)	<b>41.8</b> (12 Schools)	<b>46.6</b> (4 Schools)	<b>52.0</b> (3 Schools)	<b>40.3</b> (3 Schools)

**Southwest:** The average age of schools at modernization also increased over time in the Southwest Quad Cluster. For the ten schools programmed for modernization in 2016-2023, 2023 are currently planned to have an average age of be 46.9 years, nearly identical to the Countywide average.

**Average Age of Schools at Time of Modernization – Southwest Quad Cluster**

	<b>Modernized Before 1993</b>	<b>Modernized 1993 – 2000</b>	<b>Modernized 2001 – 2010</b>	<b>Modernized 2011 – 2015</b>	<b>Programmed for Modernization 2016-2023</b>
<b>Southwest Quad Cluster</b>	<b>34.0</b> (10 Schools)	<b>39.7</b> (12 Schools)	<b>46.6</b> (14 Schools)	<b>52.0</b> (7 Schools)	<b>46.9</b> (10 Schools)

**E. 2011 FACT Assessments and Future Outlook**

The 2011 FACT Assessments identified 34 elementary and 11 middle schools for planned future modernization. Historically, school modernization projects were concentrated in the Southwest, and Downcounty Consortium Quad Clusters. However, the majority (58%) of schools identified for

modernization as part of the 2011 FACT assessment are located in the Northeast and Northwest Quad Clusters. Moreover, the modernization queue includes seven schools (five of which are located in the two southern Quad Clusters) that were reopened without modernization. Excluding these schools, schools in the two northern Quad Clusters would comprise 68% of the modernization queue.

**2011 FACT Assessed Schools by Quad Cluster and Category**

Quad Cluster	Elementary Schools		Middle Schools	
	Schools	Percent	Schools	Percent
Northeast	<b>10</b>	29.4%	<b>2</b>	18.2%
Northwest	<b>13</b>	38.2%	<b>3</b>	27.3%
Downcounty Consortium	<b>5</b>	14.7%	<b>4</b>	36.4%
Southwest	<b>6</b>	17.6%	<b>2</b>	18.2%
<b>MCPS</b>	<b>34</b>	100.0%	<b>11</b>	100.0%

**F. Special Program and Holding Schools**

This section addresses the age and modernization of special program and holding schools. Special program schools include facilities that house career and technology, special education, and alternative education programs. Holding schools house students and staff displaced from a school during modernization or other major construction projects. Since programmatic and design needs differ at these schools, OLO staff conducted a separate analysis to understand the current age of these facilities and modernization. At present, MCPS operates six special program and six holding schools.<sup>7</sup>

**MCPS Special Program and Holding Schools**

Special Program Schools	Holding Schools
1. Thomas Edison High School of Technology	<b>1.</b> Emory Grove Center
2. Blair G. Ewing Center	<b>2.</b> Fairland Center
3. Stephen Knolls	<b>3.</b> Grosvenor Center
4. Longview	<b>4.</b> North Lake Center
5. Rock Terrace	<b>5.</b> Radnor Center
6. Carl Sandburg	<b>6.</b> Tilden Center

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<sup>7</sup> FY15 Educational Facilities Master Plan, Chapter 4. This total does not include data on the Regional Institute for Children and Adolescents (RICA).

### 1. Year of Construction

Similar to the trends for other MCPS schools, 58% (7 out of 12) of the special program and holding schools were constructed between 1950 and 1969. Only one of these facilities (the Longview School) was built after 1985.

#### Year of Building Construction: Special Program and Holding Schools

Facility Type	Median Year Built	No. of Schools	Before 1950		1950 - 1969		1970 - 1984		After 1985	
			Schools	Percent	Schools	Percent	Schools	Percent	Schools	Percent
Special Program	1966	6	--	--	3	50.0%	2	33.3%	1	16.7%
Holding	1954	6	2	33.3%	4	66.7%	--	--	--	--

### 2. Average Current Age and Modernization

Special program and holding schools are significantly older than other MCPS facilities. As detailed in Section B.1 above, the average age of all MCPS elementary, middle, and high schools is 25.1 years. In contrast, the six special program schools have an average of 37 years while the six holding schools have an average age of 52 years.

#### Average Age of Special Program and Holding Schools

	Average Age of School Buildings
Special Program Schools	37.0
Holding Schools	52.8

To date, none of the six holding centers have been modernized. Two of the six special program schools were modernized although both of these occurred in the 1970s. Two special program schools are programmed in the CIP for modernization: Thomas Edison High School of Technology (2017) and Carl Sandburg Center (2020). In addition, in May 2015, the Board of Education approved the collocation of the Rock Terrace School with Tilden Middle School which is programmed for completed modernization in 2019.

#### Average Age of Schools at Time of Modernization – Special Program Schools

	Modernized Before 1993	Modernized 1993 – 2000	Modernized 2001 – 2010	Modernized 2011 – 2015	Programmed for Modernization 2016 – 2023
<b>Special Program</b>	<b>22.5</b> (2 Schools)	--	--	--	<b>34.3</b> (2 Schools)

**1. 2011 FACT Assessments and Future Outlook**

The 2011 FACT process included assessments of four special program and four holding schools.

**Special Program and Holding Schools included in the 2011 FACT Assessments**

Special Program Schools	Holding Schools
1. Blair G. Ewing Center	1. Fairland Center
2. Stephen Knolls School	2. Grosvenor Center
3. Rock Terrace School	3. North Lake Center
4. Carl Sandburg Learning Center	4. Radnor Center

In addition, MCPS plans to modernize the Tilden holding school. Two other schools – the Longview School and the Emory Grove Holding Center – have been neither previously modernized nor assessed for future modernization. The Longview School, the youngest of the special program schools, was constructed in 2001. The Emory Grove Center was built in 1949.

**G. OLO Observations Regarding Building Age and Modernizations**

After reviewing the age of school buildings and geographic distribution of modernization projects, OLO developed the following observations and conclusions.

- 1. *The average age of MCPS schools is 25.1 years of age; the oldest school buildings including reopened, special program, and holding schools.***

MCPS school buildings have an average age of 25.1 years. The average age of County schools is reflective of the recent population growth of the County as well as the practice to modernize older school buildings. Average school age is also affected by the practice of reopening but not modernizing schools which has disproportionately occurred in the Downcounty Consortium.

Special program (career and technology, special education, and alternative education) schools, have an average age of 37.0 years, 12 years older than other MCPS schools. The average age of holding schools is 52.8 years or nearly 28 years older than the average for other schools.

- 2. *There is a geographic disparity, not bias, in the location of modernization projects.***

The majority of MCPS school buildings were constructed between 1950 and 1969. For three out of the four Quad Cluster – Northeast, Downcounty Consortium, and Southwest – the majority of schools were built in the 1950 - 1969 time period. The Northwest Quad Cluster is home to the youngest collection of school buildings with the majority of the schools in this region constructed after 1985.

School modernizations track the MCPS construction history; the highest concentration of modernizations have occurred in areas of the County (Downcounty Consortium and Southwest) with the oldest school buildings. This trend will start to shift in upcoming years. Planned future modernization projects will be focused in the Northwest and Northeast Quad Clusters.

**3. *The age at which an MCPS school is modernized has steadily increased.***

Over the past several decades, the average age of an MCPS school at time of modernization has increased from 32 years to 51 years. The current approved CIP assumes that the 21 school modernizations programmed for 2016 through 2023 will have an average age of 46 years when completed. However, any changes in the planned schedule for 2016 through 2023 projects would alter the average age.

Some degree of variation exists among geographic regions of the County regarding the planned age of schools at the time of future modernizations. The three Downcounty Consortium schools programmed for modernization by 2023 are currently planned to have an average age of 40 years while the four Northeast Quad Cluster schools programmed for modernization by 2023 are currently planned to have an average age of 49 years.

## **CHAPTER VI: ANALYSIS OF 2011 FACT SCORING**

This chapter examines the 2011 MCPS assessment of school buildings and the placement of schools in the Revitalization/Expansion program queue. This chapter consist of four sections;

- Section A. FACT Scoring and the Revitalization/Expansion Queue
- Section B. Educational Program Parameters
- Section C. Physical Infrastructure Parameters
- Section D. OLO Observations Regarding FACT Scoring

### **A. FACT Scoring and the Revitalization/Expansion Queue**

As described in Chapter II, MCPS developed a methodology to evaluate the condition of school buildings called “Facilities Assessment with Criteria and Testing” (FACT). In 2010, MCPS convened an advisory FACT Review Committee to review the evaluation criteria. The FACT process assigned points to each evaluated school based on a series of criteria (referred to as “parameters”). The FACT methodology assigned points for physical and educational building deficiencies found at the time of the evaluation. According to MCPS, “the FACT Review Committee was well aware that facility conditions change over time. Nevertheless, the prevailing view was that a comprehensive condition assessment needed to include all the parameters that are included in FACT.”<sup>1</sup> A school with a higher FACT score was found to be more deficient than a school with a lower score.

MCPS completed the FACT evaluation of school buildings in 2011. MCPS placed schools in the Revitalization/Expansion program queue in descending order of their FACT scores. The Revitalization/Expansion Capital Improvements Program (CIP) project funds modernization of school buildings according to the order established by the 2011 FACT assessment. MCPS has not re-assessed the schools in the Revitalization/Expansion program queue since 2011 nor does the school system plan to reassess the condition of these buildings in the future. The full list of all schools in Revitalization/Expansion queue ranked by FACT score appears on the following page.

The ordering of schools in the Revitalization/Expansion queue has remained unchanged since 2011, reflecting the rank order established through the FACT scoring. Given current funding and holding school constraints, the Revitalization/Expansion capital project will accommodate work on about three to six school buildings at any given time. At this rate, reconstruction of all the schools in the queue could continue beyond the year 2040.

The next section of this chapter defines and describes the scoring methodology for each of the FACT parameters. In addition, the section presents information about the scores assigned to individual schools. OLO prepared a table for each parameter showing the highest and lowest score assigned to the 34 elementary and 11 middle schools assessed in 2011. The tables also indicate the range between the highest and lowest score in order to show the extent to which scoring variations in each parameter influence the overall FACT scores assigned to schools.

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<sup>1</sup> Email correspondence from Bruce Crispell to Aron Trombka, July 16, 2015.

## FACT\* Scores (Schools Assessed in 2010–2011)

Rank	Elementary Schools	Total FACT Score Maximum Score = 600	Rank	Secondary Schools	Total FACT Score Maximum Score = 600
1	Cold Spring Elementary School	382.04	1	Rock Terrace School	382.13
2	DuFief Elementary School	357.01	2	Blair G. Ewing Center	380.99
3	Belmont Elementary School	349.28	3	Banneker Middle School	341.88
4	Stonegate Elementary School	334.95	4	Argyle Middle School	322.24
5	Damascus Elementary School	331.89	5	Newport Mill Middle School	315.72
6	Twinbrook Elementary School	330.58	6	Ridgeview Middle School	309.03
7	Summit Hall Elementary School	328.90	7	Silver Spring Intl. Middle School	301.37
8	Rosemary Hills Elementary School	327.05	8	Neelsville Middle School	291.74
9	Burnt Mills Elementary School	318.29	9	Baker Middle School	279.58
10	Poolesville Elementary School	314.42	10	Frost Middle School	255.22
11	Woodfield Elementary School	314.09	11	Loiederman Middle School	254.66
12	South Lake Elementary School	302.69	12	Redland Middle School	245.35
13	Cedar Grove Elementary School	302.46	13	North Bethesda Middle School	240.74
14	Greenwood Elementary School	300.47			
15	Piney Branch Elementary School	294.73			
16	Whetstone Elementary School	293.22			
17	Takoma Park Elementary School	292.86			
18	Gaithersburg Elementary School	290.88			
19	Strathmore Elementary School	289.46			
20	Diamond Elementary School	286.57			
21	Fox Chapel Elementary School	278.71			
22	Stephen Knolls School	276.56			
23	East Silver Spring Elementary School	276.41			
24	Broad Acres Elementary School	275.88			
25	Woodlin Elementary School	273.72			
26	Germantown Elementary School	272.61			
27	Fallsmead Elementary School	267.41			
28	Watkins Mill Elementary School	266.33			
29	Fields Road Elementary School	257.61			
30	Stedwick Elementary School	249.55			
31	Cloverly Elementary School	244.31			
32	Darnestown Elementary School	241.67			
33	Washington Grove Elementary School	227.68			
34	Bradley Hills Elementary School	212.04			
35	Sherwood Elementary School	210.92			

\* FACT refers to the Facilities Assessment with Criteria and Testing methodology for evaluating and scoring the condition of schools.

## B. Educational Program Parameters

The FACT methodology grouped the scoring parameters into two categories: Educational Program parameters and Physical Infrastructure parameters. The Educational Program parameters evaluated school building characteristics that directly influence student instruction. The FACT methodology included seven Educational Program parameters with a combined maximum score of 300 points.

A copy of the FACT scoring template prepared by MCPS appears on the next page.

### 1. Open Plan Schools

The FACT methodology assigned up to 42.00 points to buildings that include open plan design elements such as non-full-height walls, windowless classrooms, and indirect access to common spaces. MCPS constructed open plan schools in the 1960s and 1970s but discontinued this design approach by 1980. Most open plan schools have previously undergone some degree of retrofitting to modify features that no longer conform to MCPS educational standards.

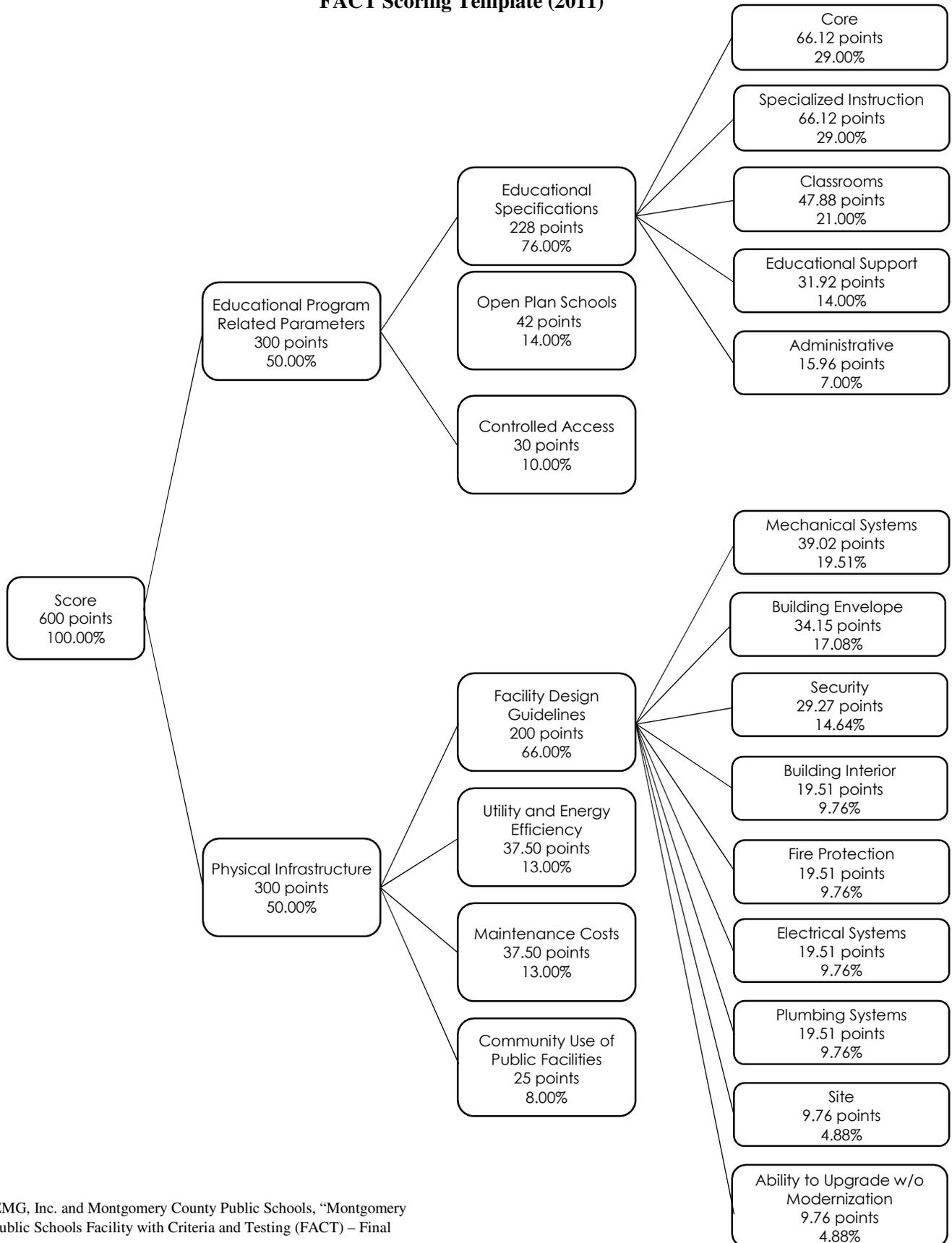
The Open Plan School parameter was highly variable among elementary schools with a range of 37.28 points between schools receiving the highest and lowest scores. Nineteen of the 34 FACT-assessed elementary school buildings received a score greater than zero for this parameter but no elementary school received the full 42.00 points. Only nine elementary schools received more than 15 points for this parameter.

None of the 11 FACT-assessed middle schools received any points for this parameter.

<b>OPEN PLAN SCHOOLS</b> <b>Maximum FACT Points: 42.00</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	37.28	0.00	37.28
<b>Middle Schools</b>	0.00	0.00	0.00

**OLO Comments:** The Open Plan Schools parameter effectively identified schools with structural deficiencies that run counter to the educational standards established by MCPS. Remediation of these deficiencies involve structural and building design modifications. As such, this parameter is pertinent to an assessment of the need to reconstruct a school. OLO notes that this parameter will become less relevant in future FACT assessments as the inventory of schools with significant open plan design features diminishes.

**FACT Scoring Template (2011)**



Source: EMG, Inc. and Montgomery County Public Schools, "Montgomery County Public Schools Facility with Criteria and Testing (FACT) – Final

## 2. Controlled Access

The FACT methodology assigned up to 30.00 points to schools that have insufficient means to control visitor access to the building. More specifically, the assessment evaluated whether a school has a security vestibule designed so that all visitors must enter the general office to check in before entering the school. In addition, this parameter gauged whether the school’s parking area and security vestibule are visible from the main office and whether the school contains secure areas capable of sheltering students in case of a long term emergency.

The Controlled Access parameter was highly variable with a range of 30.00 points. The FACT scoring system allows for three possible scores for this parameter: 30 points, 15 points, or 0 points. Among elementary schools, 17 of the 34 buildings received a score of 30; ten schools received 15 points; and seven schools received zero points. For middle schools, six of the 11 buildings received a score of 30; four schools scored 15 points; and a single school received zero points.

<b>CONTROLLED ACCESS</b> <b>Maximum FACT Points: 30.00</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	30.00	0.00	30.00
<b>Middle Schools</b>	30.00	0.00	30.00

OLO Comments: As remediation of building access and security deficiencies often involve structural and building design modifications, this parameter is pertinent to an assessment of the need to reconstruct a school.

## 3. Core

The FACT methodology includes a 66.12 point parameter relating to “core” elements of a school building. Core school elements include the multipurpose room, gymnasium, and media center. This parameter compares the size and features of these spaces against MCPS standards. The Core parameter was highly variable among elementary schools with a range between the highest and lowest scoring schools of 47.61 points. Many of the elementary schools with the highest scores in this parameter lacked a multipurpose room and have undersized gymnasiums and media centers.

Middle schools experienced less variability in this parameter with a range across all 11 schools of 21.63 points. Eight middle schools scored within the narrow band between 31.23 and 38.80 points.

<b>CORE</b> <b>Maximum FACT Points: 66.12</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	49.61	2.00	47.61
<b>Middle Schools</b>	44.54	22.91	21.63

OLO Comments: The Core parameter evaluated the amount of space in essential sections of a school building and identifies buildings that lacked or had undersized multipurpose rooms, gymnasiums, and

media centers. Remediation of the deficiencies identified by this parameter would require significant structural and building design modifications. As such, this parameter is pertinent relevant to an assessment of the need to reconstruct a school.

**4. Specialized Instruction**

The FACT methodology assigned up to 66.12 points to schools that have insufficient facilities for music, art, technology, computer, and other specialized types of instruction. The Specialized Instruction parameter was highly variable among elementary schools with a range between the highest and lowest scoring schools of 51.79 points. Many of the elementary schools with the highest scores in this parameter have undersized special education, art, and computer lab space. Several FACT-assessed elementary schools house music rooms in portable classrooms. For the purpose of calculating the Specialized Instruction score, the evaluators considered instructional space located in the portables as if it were absent from the school building.

Middle schools experienced moderate variability in this parameter with a range across all 11 schools of 34.91 points. Many of the middle schools with the highest scores in this parameter have undersized special education and computer lab space and substandard science room equipment.

<b>SPECIALIZED INSTRUCTION</b>			
<b>Maximum FACT Points: 66.12</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	66.12	14.33	51.79
<b>Middle Schools</b>	59.40	24.49	34.91

OLO Comments: This parameter evaluated the size of specialized instructional space in a school building. Remediation of the deficiencies identified by this parameter would require significant structural and building design modifications. As such, this parameter is pertinent to an assessment of the need to reconstruct a school.

**5. Classrooms**

The FACT methodology includes an assessment of classroom sizes. This parameter assigns points based on a comparison of actual classroom space against standards established by MCPS. Schools with the highest scores in this parameter have some classrooms sized below the square footage standard. However, no FACT-assessed school received even a majority of the points assigned to this parameter, indicating that, even the highest-scoring (most deficient) schools, the majority of classrooms conformed to MCPS size standards.

The highest scoring (most deficient) elementary school received a Classrooms FACT score of 22.96 points, a score that was less than half of the 47.88 maximum. The highest scoring middle school received 16.20 points, a score about one-third of the maximum.

<b>CLASSROOMS</b> <b>Maximum FACT Points: 47.88</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	22.96	0.42	22.54
<b>Middle Schools</b>	16.20	4.90	11.30

OLO Comments: This parameter evaluated classroom sizes and identified schools with undersized classrooms. Increasing the size of classrooms within the footprint of an existing building would require significant structural and design modifications. As such, this parameter is pertinent to an assessment of the need to reconstruct a school.

### **6. Educational Support**

The FACT methodology assigned up to 31.92 points to school buildings that have insufficient educational support space for English for Speakers of Other Languages (ESOL), resource rooms, and testing areas. Among elementary schools, the Educational Support parameter was highly variable with a range between the highest and lowest scoring schools of 29.26 points. The school-specific FACT reports show that elementary schools with the highest scores in this parameter have insufficient resource rooms, testing rooms, and occupational/physical therapy space.

Middle schools experienced moderate variability in this parameter with a range across all 11 schools of 11.68 points.

<b>EDUCATIONAL SUPPORT</b> <b>Maximum FACT Points: 31.92</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	31.92	2.66	29.26
<b>Middle Schools</b>	22.62	10.94	11.68

OLO Comments: This parameter identified school buildings that lacked sufficient space for educational support activities. Remediation of the deficiencies identified by this parameter could require significant structural and building design modifications. As such, this parameter is pertinent to an assessment of the need to reconstruct a school.

### **7. Administrative**

The Administrative FACT parameter assigned up to 15.96 points to schools that lacked sufficient space for administrative offices, health services, staff development, staff lounge, building service facilities, and Parent Teacher Association storage rooms. Both elementary and middle schools have a relatively small range (about eight points) between the highest and lowest scoring schools in this parameter.

<b>ADMINISTRATIVE</b>			
<b>Maximum FACT Points: 15.96</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	14.42	6.27	8.15
<b>Middle Schools</b>	14.67	6.47	8.20

OLO Comments: This parameter identified school buildings that lacked sufficient space for essential administrative, health, and building service functions. Remediation of the deficiencies identified by this parameter could require significant structural and building design modifications. As such, this parameter is pertinent to an assessment of the need to reconstruct a school.

Nonetheless, OLO determined that the FACT scoring double counted this parameter including Administrative points in both the Educational Program and Physical Infrastructure totals.

### **C. Physical Infrastructure Parameters**

The Physical Infrastructure FACT parameters evaluated the physical condition of the school buildings. The FACT methodology included twelve Physical Infrastructure parameters with a combined maximum score of 300 points. The FACT scoring template appears on page 41.

#### **1. Utility and Energy Efficiency**

The Utility and Energy Efficiency parameter compares schools' relative use of energy and water. The maximum score for this parameter was 37.50 points – 30.00 points for energy consumption and 7.50 points for water consumption.

MCPS compiled FY10 data on energy and water consumption for each FACT-assessed school.<sup>2</sup> To normalize the data for schools of different sizes, MCPS adjusted the consumption rates to a square foot basis based on building size. MCPS identified the school with the highest energy and water consumption per square foot. Next, MCPS compared the energy and water consumption of each school against that of the school with the greatest consumption per square foot. The highest cost school received the maximum (37.50) points for this parameter. All other schools were assigned points proportionately. For example, a school with half the energy and water consumption of the most consumptive school received one-half of the maximum score.

The range between the highest and lowest scoring schools was 25.75 points for elementary schools and 18.01 points for middle schools.

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<sup>2</sup> MCPS used energy consumption data from FY10 for all schools and water consumption data from FY10 for most schools. For some schools, the water consumption data used in the scoring of this parameter is from earlier years.

<b>UTILITY AND ENERGY EFFICIENCY</b> <b>Maximum FACT Points: 37.50</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	37.50	11.75	25.75
<b>Middle Schools</b>	33.00	14.99	18.01

OLO Comments: School building energy consumption, in large part, is driven by heating and cooling needs. These needs, in turn, are dependent on weather conditions that vary significantly from year to year. Therefore, energy consumption is function not only of the building conditions (such as the efficiency of HVAC equipment or the amount of insulation) but also on annual and seasonal variations in outdoor temperature. Given annual changes in weather conditions, energy consumption rates from any single year may not be representative of on-going, long-term consumption levels. As such, OLO questions using data from a single year to make long-term assumptions about future rates of school energy consumption.

In addition, as described in Chapter IV, the CIP includes a project to upgrade and replace outdated school heating, ventilation, and air conditioning (HVAC) systems. The approved CIP programs \$16 million of expenditures for HVAC improvements in FY16 and \$12 million for each of the out years. Many schools slated to receive HVAC upgrades appear on the Revitalization/Expansion queue. Furthermore, the CIP includes a separate project with additional \$2 million per year in expenditures for energy conservation improvements in MCPS buildings. HVAC and energy conservation improvements likely would produce energy consumption rates that differ from those FY10 rates used in the FACT assessment.

Finally, while reviewing the FACT documentation, OLO identified four flaws in the calculation of scores for this parameter:

- Piney Branch Elementary School received the highest elementary school score in this parameter based on its high energy and water consumption. The methodology did not take into account that Piney Branch is the only elementary school in the County that houses a swimming pool and so its energy and water consumption is not comparable to other elementary schools. As the highest scoring school in this parameter, Piney Branch was the benchmark for all other elementary schools. Had the FACT methodology adjusted the Piney Branch score to account for the swimming pool, then the scores of all elementary schools would have changed.
- The calculations used of water consumption included a formulaic error that assigned points in the inverse order of actual consumption per square foot.
- MCPS used incorrect building square footage for at least six elementary schools.
- MCPS calculated energy and water consumption per square foot using the square footage of buildings excluding portable classrooms. For schools with portable classrooms, this methodology would have over-calculated consumption rates per square.

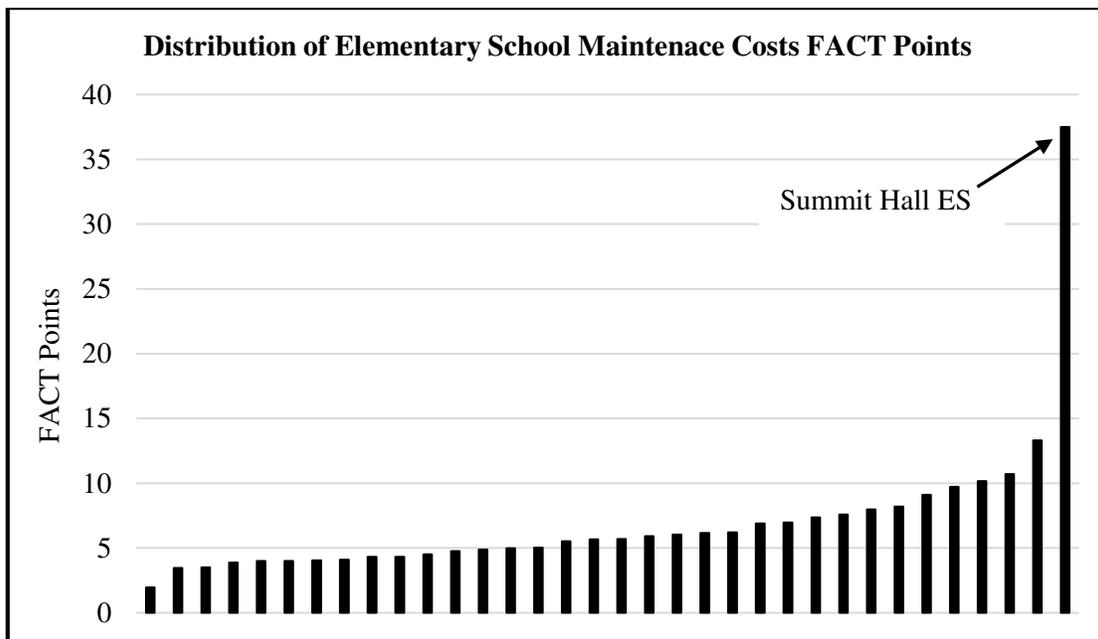
## **2. Maintenance Costs**

The Maintenance Cost parameter compares an individual school’s maintenance costs relative to other MCPS schools using a 37.50 point scale. MCPS compiled school-specific data on the cost of maintenance work orders in FY09 and FY10. To normalize the data for schools of different sizes, MCPS calculated the combined labor and materials cost for the two-year period divided by the square footage of

the building.<sup>3</sup> Next, MCPS identified the school with the highest maintenance cost per square foot. MCPS compared the maintenance cost per square foot of each school against that of the highest cost school and then proportionately assigned points. The highest cost school received the maximum (37.50) points for this parameter while, for example, a school with maintenance costs per square foot one-quarter of the highest cost school received one-quarter of the maximum score. This parameter was highly variable among elementary and middle schools with ranges between the highest and lowest scoring facilities of greater than 30 points.

MAINTENANCE COSTS Maximum FACT Points: 37.50			
	High FACT Score	Low FACT Score	Range
Elementary Schools	37.50	1.96	35.54
Middle Schools	37.50	4.49	33.01

OLO Comments: Of note is the unusual distribution of points in this parameter. The chart below displays the distribution of Maintenance Cost FACT points for elementary schools. As evident in the chart, 33 of the 34 elementary schools received scores in a narrow range from 1.96 to 13.31 points. A single school, Summit Hall Elementary School, was a high-end outlier with the maximum of 37.50.



OLO reviewed the maintenance cost data used to calculate the maintenance cost FACT points assigned to each elementary school. Through this review, OLO detected an apparent anomaly in the data. The data includes an exorbitantly high maintenance materials cost of \$427,277 for Summit Hall Elementary School in FY09. This amount is 5.6 times greater than the second highest FY09 materials cost and 27 times

<sup>3</sup> OLO notes that MCPS calculated the maintenance cost per square foot using the square footage of buildings excluding portable classrooms. If any of the work order maintenance costs incurred in FY09 and FY10 were attributable to repairs in portable classrooms, then the FACT methodology would have over-calculated the cost per square foot for schools with portable classrooms.

greater than the average materials cost for that year. Moreover, the maintenance materials cost for Summit Hall in following year, FY10, dropped to \$12,880, a 97% reduction from the FY09 amount. This data strongly suggest that the FY09 maintenance cost data for Summit Hall was a one-time anomaly and not representative of recurring expenses.

**Annual Maintenance Materials Costs Used in Elementary School FACT Assessments**

	<b>FY09</b>	<b>FY10</b>
<b>Average Cost Per School (excluding Summit Hall ES)</b>	\$15,667	\$9,864
<b>Highest Cost School (excluding Summit Hall ES)</b>	\$76,355	\$18,829
<b>Summit Hall ES</b>	\$427,277	\$12,880

School maintenance work order costs vary from year to year and are subject to occasional non-representative variations attributable to an unusual event. Indeed, repair of a major malfunctioning building system may generate a one-time large expense but could produce recurring cost reductions in subsequent years. This nature of building maintenance highlights the risk involved in evaluating a school’s long-term maintenance costs based on just two years of data. For example, had Summit Hall incurred \$12,880 in maintenance materials costs in FY09 (as it did in FY10), then the FACT methodology would have assigned the school 5.79 points for this parameter instead of the maximum 37.50 points that it actually received. In addition, under the same scenario, a different school, Burnt Mills Elementary School, would have had the highest two-year maintenance costs. As a result, Burnt Mills score for this parameter would have been raised to 37.50 points instead of the 13.31 points recorded in the FACT assessment. Building maintenance costs involve a degree temporal volatility and therefore short-term data provide a poor indicator of long-term cost trends.

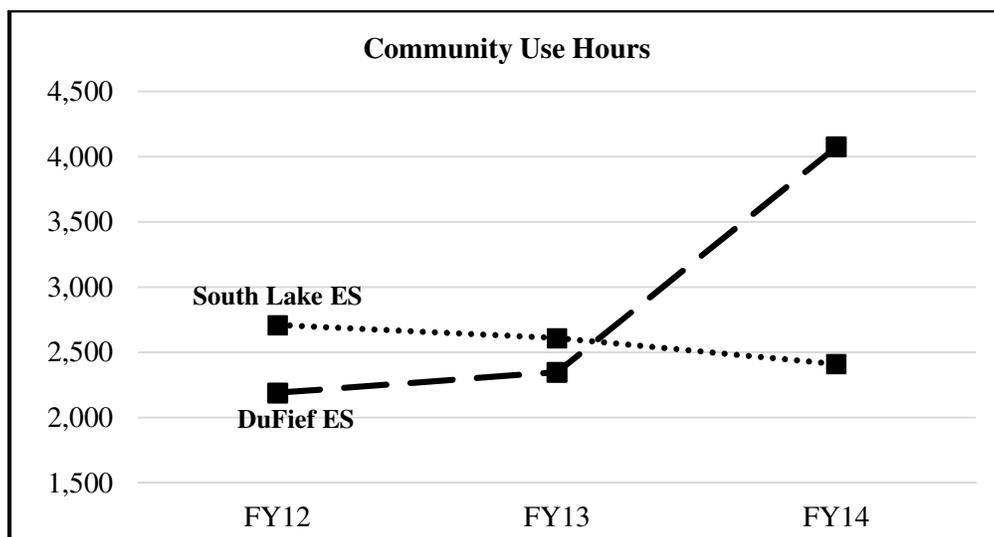
**3. Community Use of Public Facilities**

This parameter assigned up to 25.00 points based on a comparison of the number of hours of after-school community use (for example, gymnasium use, PTA activities, day care, and summer school) associated with each building. MCPS compiled data on the number of hours rooms were reserved for community use in each school during FY10. Next, MCPS compared the community use hours of each school against that of the school with the greatest number of community use hours. The highest cost school received the maximum (25.00) points for this parameter. All other schools were assigned points proportionately. For example, a school that logged half of the greatest number of community use hours received one-half of the maximum score. This parameter was highly variable among elementary and middle schools with ranges between the highest and lowest scoring facilities of greater than 20 points.

<b>COMMUNITY USE OF PUBLIC FACILITIES</b>			
<b>Maximum FACT Points: 25.00</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	25.00	1.99	23.01
<b>Middle Schools</b>	25.00	3.60	21.40

**OLO Comments:** The FACT methodology considered a single year of community use data. OLO suspected that the number of hours of community use in school buildings is subject to change from year to year. To confirm this premise, OLO requested data from Community Use of Public Facilities (CUPF) on the actual community use hours in schools. CUPF provided data from FY12 through FY14. The data indeed show annual variations in after-school community use in individual schools. To illustrate this point, OLO compared the FY12 through FY14 community use data for the elementary school which received the maximum FACT score for this parameter, South Lake Elementary, with a school, DuFief Elementary, which received two-thirds of the maximum score.

During the three-year period, community use hours at South Lake declined slightly while community use hours at DuFief increased sharply. By FY14, DuFief became the school (among FACT-assessed elementary schools) with the greatest annual community use hours while South Lake recorded only about 59% of DuFief's hours. Had the FACT assessment used FY14 data for this parameter, then DuFief would have received 25.00 points (instead of the 16.71 points received based on FY10 data) and South Lake would have received 14.79 points (instead of 25.00 points). As with the Maintenance Cost parameter, OLO concludes that scoring the Community Use of Public Facilities parameter based on short-term data and may be a poor indicator of long-term trends.



OLO requested an explanation for incorporating community use hours in the FACT assessment. MCPS responded that “the degree of after-hours use was included in the FACT methodology because this type of use impacts the maintenance needs of a school – beyond the normal school-day use.”<sup>4</sup> Thus, MCPS included this parameter as a supplemental measure of the maintenance burden associated with a school building. However, after-hours use maintenance costs are operational expenses and not inherently related to the design of the building or the condition of building systems. OLO notes that the FACT methodology did not take into account school enrollment, a factor that has more of a direct effect on school operating costs than after-hours use. Moreover, MCPS did not normalize the data in this parameter by the size or enrollment of the schools. In sum, the Community Use of Public Facilities parameter seems less related to the need for building reconstruction than other criteria assessed in the FACT process.

<sup>4</sup> Memorandum from James Song, Director of MCPS Department of Facilities Management to Aron Trombka, OLO Senior Legislative Analyst, May 8, 2015.

#### 4. Plumbing Systems

The FACT methodology assigned up to 19.51 points to schools based on an assessment of the adequacy of the existing piping, bathroom fixtures, and drinking fountains. All schools received one of three scores for this parameter: 9.76 points, 4.88 points, or 0 points. Nine elementary and three middle schools received 9.76 points; 14 elementary and six middle schools received zero points. Many of the schools with the highest scores in this parameter had insufficient toilets or drinking fountains to serve the number of students or staff in the building. Many high scoring schools also lacked sufficient wheelchair accessible bathroom stalls.

<b>PLUMBING SYSTEMS</b> <b>Maximum FACT Points: 19.51</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	9.76	0.00	9.76
<b>Middle Schools</b>	9.76	0.00	9.76

#### 5. Mechanical Systems

The Mechanical Systems parameter assigned up to 39.02 points based on an evaluation of building control and energy management systems. The evaluation is based on American Society of Heating, Refrigerating and Air-Conditioning Engineers standards for indoor air quality and outside air intake. For example, assessors determined whether temperatures could be controlled in individual rooms and whether HVAC systems could be shut down by zone after school hours.

Elementary schools received one of four possible scores for this parameter: 39.02 points (the maximum score), 29.27 points (75% of the maximum score), 19.51 (50% of the maximum score), or 0 points. The distribution of Mechanical System points for elementary schools skew toward the high end with seven buildings receiving 39.02 points and 21 buildings receiving 29.27 points. Only six of the 34 elementary schools received fewer than 29.27 points. While only a single middle school received the maximum number of points, no middle school received fewer than 19.51 points.

<b>MECHANICAL SYSTEMS</b> <b>Maximum FACT Points: 39.02</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	39.02	0.00	39.02
<b>Middle Schools</b>	39.02	19.51	19.51

#### 6. Electrical Systems

This FACT parameter assessed building electrical systems including the adequacy of the power supply, lighting intensity and efficiency, and the availability of back-up electrical supply. Three of the 34 elementary schools received the maximum score of 19.51 points. Seven of the 11 middle schools scored 13.01 points for this parameter. For both elementary and middle schools, the lowest scoring buildings received 6.50 points. Many of the schools with the highest scores in this parameter had inadequate

emergency power supply, lacked master electricity shut off switches in some rooms, had sub-standard lighting in some rooms, and had science rooms that could not be completely darkened.

<b>ELECTRICAL SYSTEMS</b> <b>Maximum FACT Points: 19.51</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	19.51	6.50	13.01
<b>Middle Schools</b>	13.01	6.50	6.51

**7. Fire Protection**

The Fire Protection parameter assigned up to 19.51 points per school based on an evaluation of the sprinkler system, fire alarm panels, kitchen fire suppression systems, and general fire code compliance in each school building. For the 34 elementary schools, this parameter experienced the maximum range in scores with one school receiving the full 19.51 points and 19 schools receiving zero points. Middle schools experienced minimal variation with three schools receiving 4.88 points and the remaining eight schools receiving zero points.

<b>FIRE PROTECTION</b> <b>Maximum FACT Points: 19.51</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	19.51	0.00	19.51
<b>Middle Schools</b>	4.88	0.00	4.88

OLO Comments (Subsections 4 -7): Many of the plumbing, mechanical system, electrical, and fire protection conditions evaluated in the FACT assessments addressed significant structural deficiencies in the school buildings. Installing additional toilets and other plumbing fixtures could require some significant reconstruction work in a school building. HVAC distribution systems often are embedded within walls, ceilings, and floors of a building, and so, system upgrades may require major changes to building structure. As remediation of major building system deficiencies often involve structural and building design modifications, these parameters are pertinent to an assessment of the need to reconstruct a school.

OLO notes, however, that several existing CIP projects provide funding for building systems upgrades and replacement including projects that address some of the deficiencies cited above. For example, the CIP includes projects to improve HVAC, fire protection, and lighting systems. The FACT methodology calculated each school’s scoring given 2011 building conditions without any mechanism to adjust scores based on subsequent remediation of deficiencies.

During the 2011 FACT evaluation, Fox Chapel Elementary School received the maximum score of 19.51 points for the Fire Protection parameter. The FACT methodology assigned the maximum score because, among other deficiencies, Fox Chapel had limited sprinkler coverage and lacked strobe alarms for the hearing impaired. However, a few months after the FACT inspection, MCPS installed new sprinklers and strobe alarms throughout the building as part of a capital project to build an addition to the school. Notwithstanding the remediation of the fire protection deficiencies, the FACT score for this school has

remained unchanged. Had Fox Chapel been assessed after the fire protection upgrade, then its FACT score for this parameter would have been 9.76 points lower than originally calculated.

### 8. Building Envelope

The Building Envelope parameter of the FACT methodology evaluated the condition of exterior walls, roofs, and the overall building structure. The assessment of each school included identifying areas of air or water penetration, deterioration and rust problems with roof joists, and the presence of wooden load-bearing building elements. The Building Envelope parameter is highly variable among elementary schools with the highest scoring schools receiving the maximum 34.15 points and the lowest scoring schools receiving zero points. Middle school scores for this parameter also experienced high variability with some schools receiving the maximum 34.15 points and the lowest scoring school receiving 8.54 points.

<b>BUILDING ENVELOPE</b> <b>Maximum FACT Points: 34.15</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	34.15	0.00	34.15
<b>Middle Schools</b>	34.15	8.54	25.61

### 9. Building Interior

The FACT methodology evaluated multiple aspects of the interior of school buildings including access from classrooms to corridors, compliance with accessibility codes, the condition of classroom walls and partitions, evidence of pest infestation, and the presence of lead or asbestos. Scoring for the parameter varied little among elementary schools. With a maximum score of 19.51 points, the range between the highest and lowest scoring elementary schools was 7.31 points. Middle schools experienced slightly more variation with a range between the highest and lowest scoring schools of 12.19 points.

<b>BUILDING INTERIOR</b> <b>Maximum FACT Points: 19.51</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	11.38	4.07	7.31
<b>Middle Schools</b>	14.63	2.44	12.19

### 10. Security

The FACT methodology assigned school buildings up to 31.92 points based on an evaluation of the school's security system including the public address system, telephone access, closed-circuit television, interior isolation doors, and the emergency notification system. Among elementary schools, the Security parameter was moderately variable with a range of 14.63 points between schools receiving the highest and lowest scores. Middle school scores for this parameter fell within a narrow range of 4.88 points.

<b>SECURITY</b> <b>Maximum FACT Points: 29.27</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	24.39	9.76	14.63
<b>Middle Schools</b>	19.51	14.63	4.88

### **11. Site**

The FACT methodology includes a Site parameter that assessed the adequacy of parking areas, traffic lanes, bus areas, pedestrian access, playfields, and stormwater management facilities. Both elementary and middle schools had a range between the highest and lowest scoring schools of 6.10 points. Many of the schools with the highest scores in this parameter had undersized bus drop off and loading zones, insufficient general parking spaces and ADA-compliant parking spaces, and ADA non-compliant paths and walkways.

<b>SITE</b> <b>Maximum FACT Points: 9.76</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	7.32	1.22	6.10
<b>Middle Schools</b>	9.76	3.66	6.10

OLO Comments (Subsections 8 – 11): The previous four parameters identified deficiencies could require significant building and site work to remedy. For example, the Building Envelope parameter assigned points to buildings in which structural load is supported by wooden (rather than steel) beams. In addition, through evaluation of the Site parameter, some schools received points for insufficient parking spaces, excessively steep driveways and walkways, inadequate bus and fire lanes, and poor underground field drainage.

OLO notes that some deficiencies in these parameters seemingly could be corrected through small scale improvements. For example, the FACT methodology assigned points to school buildings that lacked items such as carpeting in music rooms, security gates, fencing around athletic areas, and suitable playground cover material. While each of these deficiencies warrant attention, they could be addressed absent reconstruction of a school building.

### **12. Ability to Upgrade without Modernization**

The final FACT assessment parameter is called “Ability to Upgrade without Modernization.”<sup>5</sup> The final FACT report states that this parameter “is intended to recognize the relative potential to upgrade and modernize outdated or obsolete systems without full modernization.”<sup>6</sup> As an example of a building condition that would earn points under this parameter, the final FACT report describes a school building

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<sup>5</sup> The FACT Final Report was completed in 2011, before MCPS replaced the term “modernization” with “revitalization/expansion.”

<sup>6</sup> EMG Consultants and Montgomery County Public Schools, “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” October 11, 2011, p. 8.

that would require extensive building interior reconstruction to accommodate the ductwork necessary to upgrade a substandard ventilation system. The final FACT report also cites other items evaluated under this parameter including site constraints, electrical capacity, building orientation, expandability of building systems, and structural aspects (such as floor-to-ceiling heights). Elementary schools had a narrow range (4.88 points) between the highest and lowest scoring schools in this parameter while middle schools had a wider range (8.54 points.)

<b>ABILITY TO UPGRADE WITHOUT MODERNIZATION</b>			
<b>Maximum FACT Points: 9.76</b>			
	<b>High FACT Score</b>	<b>Low FACT Score</b>	<b>Range</b>
<b>Elementary Schools</b>	9.76	4.88	4.88
<b>Middle Schools</b>	9.76	1.22	8.54

**OLO Comments:** In reviewing the school-specific FACT scoring, OLO found that the assessment criteria for this parameter focused primarily on the topic of building expansion. Nearly all of the scoring criteria addressed the amount of unbuilt land area and the capacity of mechanical, electrical, and plumbing systems to accommodate building additions.

**D. OLO Observations Regarding 2011 FACT Scoring**

After reviewing the FACT methodology and scoring for all 19 scoring parameters, OLO developed the following observations and conclusions.

***1. The FACT methodology provides a quantitative method for determining the sequence of the Revitalization/Expansion queue.***

The sequence of schools listed in the Revitalization/Expansion queue was determined through a quantitative process based on defined criteria. The methodology used to rank schools within the queue involved a series of distinct evaluations of measurable building conditions and properties. OLO’s review of the FACT process found no evidence of bias or subjective decision-making in the scoring of individual schools.

***2. The Educational Program parameters used in the FACT methodology were pertinent to an assessment of the need to reconstruct a school.***

The MCPS Revitalization/Expansion program is essentially a school building reconstruction program. Projects funded through the Revitalization/Expansion CIP projects involve near complete demolition and reconstruction of school buildings with minimal salvage of existing structures. As such, the rankings of schools in the reconstruction queue should evaluate building conditions and characteristics inherently related to fixed structural design elements. The seven Educational Program FACT parameters each identify deficiencies that would require significant structural and building design modifications to correct. As such, OLO finds that the parameters in this category are pertinent to a building reconstruction needs assessment.

***3. The Physical Infrastructure parameters addressed significant structural deficiencies in school buildings.***

Many of the conditions evaluated in the FACT assessments identified deficiencies could require significant building and site work to remedy. For example, the assessments assigned points to buildings that do not accommodate current plumbing, HVAC, accessibility, and other standards. As remediation of these deficiencies could involve structural and building design modifications, these measures are pertinent to the need to reconstruct a school.

***4. Many of the Physical Infrastructure parameters involved methodologies that evaluated impermanent conditions. This approach is incompatible with establishment of a permanent queue that most frequently results in building reconstructions.***

The 2011 FACT assessments generated a queue that is intended to remain unchanged for at least two decades. The description of the assessment methodology included in the final FACT report states that “modernizations generally address building conditions that cannot be remedied through replacement of building systems... [F]acility deficiencies that can only be addressed through full modernization are the primary focus of the FACT methodology.”<sup>7</sup> Nonetheless, many of the Physical Infrastructure parameters evaluated conditions that – while relevant in the short-term – are dynamic over time and require periodic re-evaluation. A long-term capital improvements queue should account for post-assessment changes in building conditions. The usefulness and validity of the assessment scores erode as dynamic building conditions change over time.

The County’s CIP includes multiple projects to improve MCPS facilities and to upgrade or replace key school building systems. These CIP projects fund improvements such as ADA compliance, fire safety upgrades, and HVAC systems replacement. Schools in the Revitalization/Expansion queue are eligible to receive improvements and upgrades through several of these CIP projects. As the FACT assessments were a one-time undertaking, no mechanism exists to adjust scores to account for deficiencies that have been rectified. As an example, Fox Chapel Elementary School received the maximum score for the Fire Protection parameter, in part, because, the FACT assessment found that the school had limited sprinkler coverage and lacked strobe alarms for the hearing impaired. Several months after the FACT inspection, MCPS installed new sprinklers and strobe alarms throughout Fox Chapel. Notwithstanding the remediation of the fire protection deficiencies, the FACT score remained unchanged.

Moreover, the FACT methodology relied on one or two years of data to assign scores for measures with potential for significant annual variations. The first three Physical Infrastructure parameters – Utility and Energy Efficiency, Maintenance Costs, and Community Use – each gauge a variable that experiences marked changes from year to year. Given the annual variability of the data for all three of these parameters, short-term data provide a poor indicator of recurring, long-term conditions. The FACT methodology did not survey a sufficient time span to correct for one-year data outliers or to identify shifting trends. As such, the scores for these parameters may not reflect conditions today or over the long-term duration of the queue.

Finally, the FACT assessments evaluated conditions that could be corrected through relatively small scale improvements. The FACT methodology assigned points to school buildings that lacked items such as carpeting in music rooms, security gates, fencing around athletic areas, and suitable playground cover material. While each of these deficiencies warrant attention, they could be addressed absent reconstruction of a school building. These types of conditions are better addressed through systematic improvements rather than through a process that most frequently results in near or complete building reconstruction.

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<sup>7</sup> EMG Consultants and Montgomery County Public Schools, “Montgomery County Public Schools Facility Assessment with Criteria and Testing (FACT) – Final Report,” October 11, 2011, p. 6.

**5. *OLO identified errors in the FACT score calculations.***

The calculation of FACT scores included multiple errors; correction of these flaws would alter the results of the 2011 FACT assessments. OLO determined that the FACT scoring: (a) double counted points for the Administrative parameter; (b) used incorrect square footage data in the calculation of maintenance and utility consumption rates for some schools; (c) used Piney Branch Elementary School as the scoring benchmark in the Utility and Energy Efficiency parameter without accounting for the presence of a swimming pool at the school; (d) included a formulaic error in the calculation of relative water consumption rates; and (e) failed to adjust for a clear data outlier in the calculation of relative school maintenance costs. While OLO identified the above five errors, OLO did not conduct a complete audit of all FACT scoring calculations.

**6. *A small change in FACT scoring could have a significant effect on the placement of a school in the Revitalization/Expansion queue.***

MCPS ordered schools in the Revitalization/Expansion program queue based on the FACT scoring conducted in 2011. Small differences in FACT scores would have affected the sequence of schools in the queue. For many schools, a one or two point change in their FACT score would have altered their placement in the queue. Among elementary schools, a mere 21 points separates the school in the 15<sup>th</sup> place on the queue from the school in the 25<sup>th</sup> place. Given that current funding levels and the limited availability of holding schools constrains the pace of Revitalization/Expansion projects, a difference of a few spots in the queue could affect the scheduling of a school's modernization by multiple years.

## CHAPTER VII. SCHOOL MODERNIZATION PROGRAMS IN OTHER JURISDICTIONS

This Chapter examines school modernization programs in other jurisdictions with a focus on how these jurisdictions assess the need for modernization, prioritize capital investments, and inform the community about the condition and planned improvements of school buildings. This Chapter is organized as follows:

- Section A. Facility Condition Index
- Section B. Practices in Other School Districts
- Section C. OLO Observations

### A. Facility Condition Index

Many districts throughout the United States employ a standardized system called the “facility condition index” (FCI) to evaluate and score the physical condition of school buildings. The FCI is a “uniform, single-figure industry measure that is calculated as the ratio between correcting the deficiencies in a facility and the replacement cost of the facility.”<sup>1</sup> The FCI produces a percentage which represents the cost of renovating a school building to meet current standards divided by the cost of replacing the building.

$$\text{Facility Condition Index} = \text{Cost of Repairs} / \text{Current Replacement Cost}^2$$

A high FCI score indicates a building is in poor condition and in need of replacement. A mid-range FCI score signifies a need for building renovation while a low score indicates a building in good condition. Use of the standardized FCI allows for comparison of building conditions within and across school systems. In February 2015, the Maryland Interagency Committee on School Construction determined that it would cost approximately \$8 million to conduct a statewide FCI assessment of all schools in the State over 25 years of age. Although it acknowledged that current budget constraints limit the ability to conduct the statewide assessment at this time, the Interagency Committee presented a possible FCI rating scale for Maryland public schools.<sup>3</sup>

#### Maryland Interagency on School Construction - Facility Condition Index

FCI	Rating	Action
Cost of renovations <b>at or below 10%</b> of reconstruction costs	Good Condition	Building requires normal maintenance and scheduled life-cycle replacement of building systems
Cost of renovations <b>between 11% and 64%</b> of reconstruction costs	Fair Condition	Building requires renovation
Cost of renovations <b>at or more than 65%</b> of reconstruction costs	Poor Condition	Complete replacement or abandonment is warranted

The FCI measure also allows a school system to project the cost of future building repairs, upgrades, and renovation. For example, the Dallas Independent School District (ISD) employs the FCI to compare the

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<sup>1</sup> David Lever, Executive Director, Public School Construction Program, “Report to the Education and Economic Development Sub-Committee” Feb. 9, 2015, State of Maryland, Interagency Committee on School Construction.

<sup>2</sup> Current replacement cost equals the total cost of rebuilding or replacing an existing facility (in current dollars) to its optimal condition under current codes and construction methods.

<sup>3</sup> Lever, “Report to the Education and Economic Development Sub-Committee.”

current costs of school building replacement with the cost of renovating the existing structure.<sup>4</sup> Dallas ISD conducted a systemwide FCI evaluation of elementary schools, middle schools, high schools, athletic facilities, and administrative buildings in 2013.

The table below shows the 2013-2020 combined FCI for all Dallas ISD elementary schools. Dallas ISD identified \$1.16 billion of current building renovation needs for these schools.<sup>5</sup> This amount equals 38.11% of the estimated \$3.05 billion cost of replacing each elementary school, resulting in an FCI of 38.11%. For an FCI in this range, Dallas ISD elects to emphasize building renovations instead of replacements.

**Dallas Independent School District 2013-2020 Facility Condition Index: All Elementary Schools**

<b>Asset Class</b>	<b>Cost of Building Replacement</b>	<b>Cost of Renovation Needs (2013-2020)</b>	<b>2013-2020 FCI</b>
Elementary Schools	\$3,049,868,312	\$1,162,374,255	38.11%

Dallas ISD also assesses the FCI of individual schools. The table below shows the 2013-2020 building replacement and renovation costs for three Dallas elementary schools as well as the resulting FCI for each school. Rosemont Elementary School, with an FCI of 28.95%, is a likely candidate for renovation. Miller Elementary School, with an FCI of 63.30, would be a more likely candidate for replacement. However, Dallas ISD considers other factors in addition to FCI, including availability of resources and enrollment projections, in determining whether to replace or renovate a school.

**Dallas Independent School District 2013-2020 Facility Condition Index: Select Elementary Schools**

<b>Elementary School</b>	<b>Cost of Building Replacement</b>	<b>Cost of Renovation Needs (2013-2020)</b>	<b>2013-2020 FCI</b>
Rosemont	\$17,114,201	\$4,955,169	28.95%
Runyon	\$23,230,208	\$8,636,467	37.18%
Miller	\$16,570,534	\$10,489,147	63.30%

**B. Practices in Other School Districts**

OLO studied the school modernization practices in five other jurisdictions. For this comparison, OLO selected school districts that have similar characteristics to Montgomery County in regard to public school enrollment and the age and number of school buildings. This section examines the school modernization practices in the following five school districts:

- Anne Arundel County Public Schools (MD);
- Baltimore County Public Schools (MD);
- Dallas Independent School District (TX);
- DeKalb County Public Schools (GA); and
- Fairfax County Public Schools (VA).

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<sup>4</sup> Dallas ISD, “2013 Facilities Condition Assessment,” <http://www.dallasisd.org/cms/lib/TX01001475/Centricity/Domain/1/ParsonsReport.pdf>

<sup>5</sup> Dallas ISD defines current renovation needs as projects that would be funded during the current capital budget period (2013-2020).

## 1. Renovation versus Reconstruction

Each of the school systems studied by OLO have established criteria for assessing the condition of school buildings and have set forth policies to determine whether to renovate or reconstruct aging school buildings.

- **Anne Arundel County Public Schools** identified seven areas (special education, alternative education, facility conditions and suitability, utilization, full day kindergarten, safety and security of buildings, and reconfiguration of grade levels) of potential school building deficiencies. Based on a study of these seven areas, Anne Arundel determines whether a school will be:
  - Revitalized: correction of building and life safety deficiencies;
  - Modernized: improvement of existing building to meet current education and code requirements (may include additions); or
  - Replaced: design and construction of a new school building that meets current education specifications and complies with current building, life safety, and accessibility standards and codes.<sup>6</sup>
- **Baltimore County Public Schools** assesses each school building and site as to its “physical capability to provide a modern educational program.”<sup>7</sup> Baltimore County developed facility assessments to address five specific concerns – (a) capacity, (b) use of modular classrooms, (c) open educational spaces, (d) building age, and (e) lack of air conditioning.<sup>8</sup> These deficiencies are addressed through renovations/additions, limited renovations of five building systems, and single systematic projects. School reconstruction is reserved for schools with the greatest number of deficiencies.<sup>9</sup>
- The **Dallas ISD** designed school facility planning and assessment criteria to address programmatic needs (pre-kindergarten needs, public school choice, and career academies), facility condition, and utilization.<sup>10</sup> The school system prioritizes renovation and reconstruction projects based on programmatic needs, school utilization, and facility condition.
- The **DeKalb County School System** prioritized projects based on assessments of facility condition, education suitability, technology readiness, and capacity. The District’s ten year Master Plan (approved in September 2011) focused on three goals – reduce the number of buildings, reduce the average age of school facilities, and relieve overcrowding.<sup>11</sup> Decisions to

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<sup>6</sup> Anne Arundel County Public Schools Strategic Facilities Utilization Master Plan, [http://www.aacps.org/html/press/mgt\\_strategic.asp](http://www.aacps.org/html/press/mgt_strategic.asp).

<sup>7</sup> Baltimore County Public Schools, “Systemwide Physical Facilities Assessment,” December 2014, available at <http://www.bcps.org/reports/121214-PFA.pdf>.

<sup>8</sup> *Ibid.*

<sup>9</sup> Personal Communication with Merrill E. Plait, P.E., Administrator, Office of Engineering and Construction, Department of Physical Facilities, Baltimore County Public Schools. Baltimore County defines renovation, limited renovation, and systemic renovations based on definitions provided by the State of Maryland Public School Construction Program.

<sup>10</sup> Dallas ISD Future Facilities Task Force, “Destination 2020: Comprehensive Plan,” available at <http://www.dallasisd.org/Page/32132>.

<sup>11</sup> DeKalb County School District, “Local Facilities Plan 7/1/2012 – 6/30/2017,” available at [http://www.dekalb.k12.ga.us/www/documents/splost-iv/archive/644\\_DeKalb\\_0022017\\_LFP\\_040213\\_Final%20Plan.pdf](http://www.dekalb.k12.ga.us/www/documents/splost-iv/archive/644_DeKalb_0022017_LFP_040213_Final%20Plan.pdf)

renovate or reconstruct are based on the needs of each Super Cluster (similar to MCPS Quad Clusters). The district selected schools with the lowest scores for facility condition and educational suitability were selected for reconstruction (six elementary schools, two middle schools, and one high school). The Master Plan also designates funding for renovations (six schools) and facility upgrade projects (105 schools). Additional funding is programmed for safety and security upgrades, technology upgrades, and athletic field renovations.<sup>12</sup>

- **Fairfax** determined that a new building will cost approximately 20-30% more than the renovation of an existing building, including demolition and recycling costs.<sup>13</sup> Further, the District cites environmental concerns as a reason to prioritize renovation projects over reconstruction projects. Fairfax County Public Schools calculated that the initial carbon contribution of a school building is absorbed in 45 years for elementary schools and 75-80 years for a high school. With the average age of 45 years for buildings in the current capital improvements queue, the initial carbon footprint has yet to be absorbed. Furthermore, renovations produce less non-recyclable demolition debris than full reconstruction. As stated in the Fairfax County Public Schools CIP: “It is safe to say that the most sustainable building is one that is already built, even if the renovated existing building may not be as energy efficient as would a new building.”<sup>14</sup>

## 2. Scope of Assessment

The number of buildings assessed can vary by jurisdiction, however the majority of school systems studied by OLO conduct systemwide assessments. The table below details the scope of building assessments for the five case study school systems.

**Scope of Building Assessment by School System**

School System	Scope of Assessment
Anne Arundel County Public Schools	All School Buildings
Baltimore County Public Schools	All School Buildings
Dallas ISD	All School Buildings, Athletic Fields, Vacant Property, and Administrative Properties
DeKalb County School System	All School Buildings, Athletic Fields, Vacant/Closed Sites, and Administrative Properties
Fairfax County Public Schools	All School Building Constructed Prior to 1992

## 3. Building Condition Assessment Criteria

Facility assessment criteria vary by jurisdiction. All school systems studied by OLO assess the physical conditions and educational suitability of school buildings. In addition, some school systems assess other

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<sup>12</sup> DeKalb County School District, “10-Year Facility Master Plan,” September 12, 2011, available at <http://www.dekalb.k12.ga.us/www/documents/vision-2020/master-plan.pdf>. See also DeKalb County School District, “SPLOST IV Schedule (Cash-Flow Basis, October 24, 2014 Version,” available at <http://www.dekalb.k12.ga.us/www/documents/splost-iv/board-approved-splost-iv-sequence-schedule.pdf>, for the Board approved schedule of capital improvement projects.

<sup>13</sup> Office of Facilities Planning, Fairfax County Public Schools, Capital Improvement Program 2014-2018, pp. 24-27

<sup>14</sup> *Ibid.*

conditions. For example, Anne Arundel County and the DeKalb County include an evaluation of technology readiness in their assessment of school buildings.

Two of the school systems studied by OLO, Dallas and DeKalb County utilize the Facility Condition Index (FCI, see description above) to assess the physical condition of school buildings. Within Maryland, Baltimore City and Prince George's County Public Schools also use the FCI.

#### **4. Capacity Considerations**

Many school districts measure capacity/utilization concurrent with facility conditions. In many communities, the decision to reconstruct a school results from a combined assessment of enrollment and capacity, the condition of building systems, and the educational suitability of the facility.

- When evaluating capacity improvements, **Anne Arundel County Public Schools** concurrently considers school boundaries as well as the educational suitability and physical condition of an existing school building.<sup>15</sup>
- **Baltimore County Public Schools** address capacity and utilization of a school building when determining whether to renovate, build an addition, or alter school boundaries. Baltimore County prioritizes projects for schools that are most over-capacity and that have the greatest number of physical deficiencies.<sup>16</sup>
- The **Dallas ISD** separately assesses building conditions (as measured by the FCI) and school capacity (as measured by a utilization percentage). In prioritizing capital projects, Dallas adds the FCI and utilization percentages to develop a composite score. Schools that receive the highest composite score are given priority for capital improvements.<sup>17</sup>
- The **DeKalb County School System** assesses capacity separately from the facility condition. Decisions regarding additions or reconstruction of schools are made in tandem with decisions regarding boundary changes, school consolidation, and building renovation.<sup>18</sup>
- **Fairfax County Public Schools** originally included capacity in its building assessments, however after the initial assessments in 2008 the Fairfax Board of Education removed capacity from the assessment criteria to depoliticize the process.<sup>19</sup>

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<sup>15</sup> Personal communication with Lisa Seaman-Crawford, AIA, LEED AP, Director of Facilities, Anne Arundel County Public Schools.

<sup>16</sup> Personal Communication with Merrill E. Plait, P.E., Administrator, Office of Engineering and Construction, Department of Physical Facilities, Baltimore County Public Schools. See also <http://www.bcps.org/reports/121214-PFA.pdf>.

<sup>17</sup> Dallas ISD Future Facilities Task Force, "Destination 2020: Comprehensive Plan," available at <http://www.dallasisd.org/Page/32132>.

<sup>18</sup> DeKalb County School System, "10 Year Facility Master Plan", 2011, page 4, <http://www.dekalb.k12.ga.us/www/documents/vision-2020/master-plan.pdf>.

<sup>19</sup> Personal communication with Kevin Sneed, Special Projects Administrator, Design and Construction Services, Fairfax County Public Schools.

## 5. Reassessment of Building Conditions

As the conditions of school buildings change over time, many school districts recognize the need to periodically revisit the renovation and reconstruction queue. Some also routinely re-evaluate their assessment criteria. Often, school systems conduct comprehensive assessments, followed by subsequent updates after completion of capital improvements at a school.

- In 2005, **Anne Arundel County Public Schools** developed a ten-year plan for school building capital improvements. Schools were placed in a queue based on priority level as determined through the facility assessment process. As a result of fiscal constraints, the school system did not complete the full list of priority projects by 2015. Currently, Anne Arundel Public Schools is developing an updated schedule to complete the remaining projects.<sup>20</sup>
- **Baltimore County Public Schools** finalized its most recent assessments in October of 2014. Reassessments will occur on a routine basis – as capital work is completed in a building, staff will update the assessment score.<sup>21</sup> At present, Baltimore County Public Schools is working on its “Schools for Our Future” program to modernize schools and address rising enrollment over the next 10 years.<sup>22</sup>
- **Dallas ISD** completed a comprehensive facility assessment study in 2013. The District established a 27 member committee known as the Future Facilities Task Force to develop a list of priority projects. In June 2015, the Task Force issued a draft plan to address school-by-school deficiencies including replacement schools to address severe overcrowding, additions, and replace failing infrastructure (roof, HVAC, etc.). The District is in the process of implementing this plan.<sup>23</sup>
- **The DeKalb County School System** mostly recently conducted comprehensive facility assessments in 2011. The school system recognizes the dynamic nature of building conditions. As stated in DeKalb’s ten-year school facility master plan:

The values of the combined scores are and will be fluid over the course the master plan. As facilities are improved and/or experience further decline, the value of the combined scores for each facility will change and the evaluation of the conditions to reflect these changes must be updated.<sup>24</sup>

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<sup>20</sup> Personal communication with Lisa Seaman-Crawford, AIA, LEED AP, Director of Facilities, Anne Arundel County Public Schools.

<sup>21</sup> Personal Communication with Merrill E. Plait, P.E., Administrator, Office of Engineering and Construction, Department of Physical Facilities, Baltimore County Public Schools.

<sup>22</sup> Baltimore County Government, News Release, Executive Kevin Kamenetz: “State of Our County is Strong,” April 14, 2015, available at <http://www.baltimorecountymd.gov/News/releases/0414budgetmessagenews.html>.

<sup>23</sup> Dallas ISD Future Facilities Taskforce available at <http://www.dallasisd.org/Page/32132>. See also Dallas ISD, “Trustees Briefed on Draft \$1.59 Billion Plan to Address Critical Facility Needs,” June 25, 2015, available at <https://thehub.dallasisd.org/2015/06/25/trustees-briefed-on-draft-1-59-billion-plan-to-address-critical-facility-needs/>.

<sup>24</sup> DeKalb County School System, “10 Year Facility Master Plan”, 2011, page 4, <http://www.dekalb.k12.ga.us/www/documents/vision-2020/master-plan.pdf>.

DeKalb will conduct two-part facility condition assessments over the next year in preparation for the 2017-2022 capital improvements program. The first part of the assessment will examine the physical conditions of school buildings; the second part will look at educational suitability.<sup>25</sup>

- **Fairfax County Public Schools** last conducted building condition assessments in 2008. The school system plans to update assessment criteria in the Fall of 2015. When this is completed, the updated criteria will be applied to the schools in the current school modernization queue.<sup>26</sup>

## 6. Public Accessibility to School Building Condition Assessments

Although varying in format, each of the jurisdictions make facility condition reports and assessment scores available to the public.

- **Anne Arundel County Public Schools** provides a comprehensive facility assessment report on its website. This report contains the overall score of a building, a summary of scores for each assessment criteria, a list of deficiencies at each school, and recommendations to address each deficiency.<sup>27</sup>
- **Baltimore County Public Schools** provides a comprehensive facility assessment report on its website. This report contains the overall score of a building, a summary of scores for each assessment criteria, and a list of deficiencies at each school.<sup>28</sup>
- The **Dallas ISD** website allows the public to search by school name and to read the assessment report, a summary of scheduled building improvements, and the construction timeline.<sup>29</sup>
- The **DeKalb County School System** website posts a comprehensive facility assessment report that includes detailed information on building condition assessment methodology as well as the scoring from the most recent (2011) assessments.<sup>30</sup>
- **Fairfax County Public Schools** developed an online building condition dashboard which provides school specific data on building square feet, site acreage, floor ratio, year constructed and year renovated, and the number of portables and classrooms by grade. The school system also posts building condition score sheets online.<sup>31</sup>

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<sup>25</sup> DeKalb County School District, “Building Spaces Project Team Conducts Facility Condition Assessments of DeKalb County School District Schoolhouses”, June 22, 2015, <http://www.dekalb.k12.ga.us/www/news-and-events/wp-content/uploads/sites/6/2015/06/News-Release.SPACES-.6.22.15.pdf>.

<sup>26</sup> Personal communication with Kevin Sneed, Special Projects Administrator, Design and Construction Services, Fairfax County Public Schools

<sup>27</sup> Anne Arundel County Public Schools, “Final Report,” [http://www.aacps.org/html/press/mgt\\_strategic.asp](http://www.aacps.org/html/press/mgt_strategic.asp).

<sup>28</sup> Baltimore County Public Schools, “BCPS Systemwide Physical Facilities Assessment,” <http://www.bcps.org/reports/121214-PFA.pdf>

<sup>29</sup> For individual school score sheets and school construction timelines, *see* “Our Students. Our Future. 2008 Dallas ISD Bond Program.” [http://dallasisd2008bond.org/index.php/schools/detail/Clinton\\_P.\\_Russell\\_Elementary\\_School/](http://dallasisd2008bond.org/index.php/schools/detail/Clinton_P._Russell_Elementary_School/)

<sup>30</sup> DeKalb County School System, “2011 Comprehensive Facility Assessment Report,” [http://www.dekalb.k12.ga.us/www/documents/vision-2020/facility-report-\(2011\).pdf](http://www.dekalb.k12.ga.us/www/documents/vision-2020/facility-report-(2011).pdf).

<sup>31</sup> For individual score sheets for assessed schools, *see* Fairfax County Public Schools, “2008 Facility Evaluations,” <http://www.fcps.edu/fts/designconst/facilityevaluations/index.shtml>. For the Facility and Enrollment Dashboard, *see* Fairfax County Public Schools, “Dashboard Site, School year 2014-15,” <http://www.fcps.edu/fts/dashboard/index.shtml>.

### **C. OLO Observations**

The five school districts studied by OLO employ different practices to assess the need for school modernization. OLO found many practices that were common to all five districts. Similar to MCPS, each district evaluated school buildings for education suitability as well as for physical conditions. OLO notes the following areas where MCPS practices differ from most or all of the other school districts studied in this report.

- Each of the school districts studied by OLO use a building evaluation process to assess the need for both school renovation and reconstruction. In these districts, the most common outcome of the assessment process is targeted renovations; only schools with the worst conditions are designated for reconstruction. Some school districts use a methodology called the Facility Condition Index to compare the cost of building renovation with the cost of building replacement. In comparison, MCPS Revitalization/ Expansion projects most frequently involve complete or near complete reconstruction of a school building.
- Four of the five school districts studied by OLO include all school buildings – regardless of age – in their facility assessments. This practice allows for the development of a systemwide inventory of all school building deficiencies to be used for capital improvement planning purposes. In contrast, the FACT process employed by MCPS almost exclusively assessed buildings over a designated age.
- MCPS has a longer planned duration for its school modernization queue than any school system studied by OLO. The current MCPS’ queue is intended to remain unchanged for at least two decades. Other school districts periodically re-assess the condition of their schools and revise their capital improvements plan accordingly.
- All the school districts studied by OLO posted school building assessment reports available to the public via the Internet. In 2011, MCPS posted the results of the FACT assessments on its website. At present, however, the school-specific FACT results are not available online.

## **CHAPTER VIII: FINDINGS AND DISCUSSION QUESTIONS**

This chapter summarizes the major findings of this report and presents the discussion questions developed by the Office of Legislative Oversight (OLO) based on the findings. This chapter includes two sections:

- Section A. Summary of Report Findings
- Section B. Discussion Questions

### **A. Summary of Report Findings**

The major findings of this report include:

#### *School Modernization Program History (Chapter 2)*

- When developing the scope of a Revitalization/Expansion project, MCPS plans for the complete or near complete reconstruction of the building, rather than a renovation of the existing structure.
- Capacity considerations do not affect whether or when a school is included in the Revitalization/Expansion program. Other MCPS capital programs, most notably building additions, are intended to address capacity needs. However, once a school is scheduled for reconstruction through the Revitalization/Expansion program, MCPS will include capacity considerations in the project scope as needed to accommodate projected enrollment.
- MCPS has not re-assessed the schools in the Revitalization/Expansion program queue since 2011 nor does the school system plan to reassess the condition of these buildings in the future.

#### *MCPS Policies and Practices (Chapter 3)*

- The MCPS Board of Education approved a policy (Policy FKB) to emphasize capital projects that extend the useful life of school buildings and defer the need for building reconstruction.

#### *Capital Improvements Expenditures (Chapter 4)*

- During the five-year period from FY12 through FY16, school reconstruction expenditures totaled \$578.2 million or nearly half of total MCPS capital expenditures. The scope of a school Revitalization/ Expansion capital project frequently includes the addition of classrooms.
- The County CIP includes at least eleven projects to upgrade schools and to replace school building systems. These capital projects serve to extend the useful life of MCPS facilities.
- The FY16 approved CIP includes \$120.7 million for the Current Revitalization/Expansion capital project. In contrast, approved FY16 expenditures for the eleven CIP projects to extend the useful life of MCPS buildings total \$49.8 million. As such, the CIP assumes that MCPS will spend about two-and-a-half times as much in FY16 for Revitalization/Expansion projects than it will spend for upgrades and improvements to major school building systems.

*Age and Location of School Buildings and Modernizations (Chapter 5)*

- MCPS school buildings have an average age of 25.1 years. The oldest school buildings include reopened, special program, and holding schools.
- There is geographic disparity, not bias, in the location of school modernization projects. School modernizations track the MCPS construction history; the highest concentration of modernizations have occurred in areas of the County with the oldest school buildings (the Downcounty Consortium and Southwest Quad Cluster). This trend will start to shift in upcoming years. Planned future modernization projects will be focused in the Northwest and Northeast Quad Clusters.
- Over the past several decades, the average age of an MCPS school at time of modernization has increased from 32 years to 51 years. The current approved CIP assumes that the 21 school Revitalization/Expansion projects programmed for 2016 through 2023 will have an average age of 46 years when completed. However, any changes in the planned schedule for 2016 through 2023 projects would alter the average age.

*Analysis of 2011 FACT Scoring (Chapter 6)*

- The sequence of schools listed in the Revitalization/Expansion queue was determined through a quantitative process known as Facility Assessment with Criteria and Testing (FACT) based on defined criteria. OLO's review of the FACT process found no evidence of bias or subjective decision-making in the scoring of individual schools.
- The seven Educational Program FACT parameters each identified deficiencies that would require significant structural and building design modifications to correct. As such, OLO finds that the parameters in this category are pertinent to a building reconstruction needs assessment.
- The Physical Infrastructure parameters addressed significant structural deficiencies in school buildings that are pertinent to a building reconstruction needs assessment.

Many of the Physical Infrastructure parameters involved methodologies that evaluated impermanent conditions. This approach is incompatible with establishment of a permanent queue that most frequently results in building reconstructions. Several schools in the reconstruction queue have undergone capital improvements to upgrade or replace key building systems. As the FACT assessments were a one-time undertaking, no mechanism exists to adjust scores to account for deficiencies that have been rectified.

- The FACT methodology relied on one or two years of data to assign scores for measures that have the potential for significant annual variation (including utility consumption, maintenance costs, and community use). The FACT methodology did not survey a sufficient time span to correct for one-year data outliers or to identify shifting trends.
- The calculation of FACT scores included multiple errors; correction of these flaws would alter the results of the 2011 FACT assessments.
- A small change in FACT scoring could have a significant effect on the placement of a school in the Revitalization/Expansion program queue. For many schools, a one or two point change in their FACT score would have altered their ranking in the queue. Among elementary schools, a

mere 21 points separates the school in the 15<sup>th</sup> place on the queue from the school in the 25<sup>th</sup> place. Given that current funding levels and the limited availability of holding schools constrain the pace of reconstruction projects, a difference of a few spots in the queue could affect the scheduling of a school's reconstruction by multiple years.

*School Modernization Programs in Other Jurisdictions (Chapter 7)*

- Each of the school districts studied by OLO use the building evaluation process to assess the need for both school renovation and reconstruction. In these districts, the most common outcome of the assessment process is targeted renovations; only schools with the worst conditions are designated for reconstruction. In comparison, MCPS Revitalization/ Expansion projects most frequently involve complete or near complete reconstruction of a school building.
- Four of the five school districts studied by OLO include all school buildings – regardless of age – in their facility assessments. This practice allows for the development of a systemwide inventory of all school building deficiencies to be used for capital improvement planning purposes. In contrast, the FACT process employed by MCPS almost exclusively assessed buildings over a designated age.
- MCPS has a longer planned duration for its school modernization queue than any school system studied by OLO. The current MCPS queue is intended to remain unchanged for at least two decades. Other schools districts periodically re-assess the condition of their schools and revise their capital improvements plan accordingly.
- Each of the other school districts studied by OLO make school building assessment reports available to the public via the Internet. In 2011, MCPS posted the results of the FACT assessments on its website. At present, however, the school-specific FACT results are not available online.

**B. Discussion Questions**

The County Charter grants the Council the authority to approve the Capital Improvement Program including project-specific expenditure schedules and appropriations levels. The authority extends over MCPS capital projects. Based on the findings of this report, OLO suggests that the Council discuss the following questions with MCPS representatives.

1. What should be the relationship between the Revitalization/Expansion program and other elements of the MCPS Capital Improvements Program including projects to extend the useful life of existing buildings (such as roof and HVAC replacements) and projects to address capacity issues (such as additions)?
2. What is the optimal relative allocation of capital dollars spent on school building modernizations versus improvements that extend the useful life of school buildings?
3. What should be the planned useful life of a school building? Under what circumstances should a school building be reconstructed?

4. Should the 2011 FACT assessments be the basis for the sequencing of a school modernization queue that could extend for at least 20 years? Should MCPS periodically re-evaluate school conditions and their relative need for modernization?
5. What information about school building assessments should be made available to the public?

## **CHAPTER IX. AGENCY COMMENTS**

The Office of Legislative Oversight (OLO) circulated a final draft of this report to the Interim Superintendent of the Montgomery County Public Schools. OLO appreciates the time taken by MCPS staff to review the draft report and provide comments. The final report incorporates technical corrections provided by the MCPS.

The written comments received from Interim Superintendent appear on the next page.



July 22, 2015



Dr. Chris Cihlar, Director  
Montgomery County Office of Legislative Oversight  
Stella B. Werner Council Office Building  
100 Maryland Avenue  
Rockville, Maryland 20850

Dear Dr. Cihlar:

Montgomery County Public Schools (MCPS) appreciates the work of the Office of Legislative Oversight (OLO) and the collaborative manner in which the authors of the report, *A Review of the MCPS Revitalization/Expansion Program*, worked with our staff. As an organization committed to the Malcolm Baldrige principles of performance excellence and continuous improvement, we are constantly searching for ways to improve and this report provides very useful information. Our goal always is to spend the resources entrusted to us in the most effective and efficient way possible, and we believe that our capital improvements program delivers exceptional quality at an excellent cost to the community. We look forward to discussing our revitalization/expansion program and the discussion questions raised by OLO in the report; however, we are concerned that aspects of the report offer an incomplete perspective on the MCPS revitalization/expansion program. Our main concerns fall into two important areas—the condition of schools constructed during the 1960s and 1970s and the cost effectiveness of our revitalization/expansion projects.

#### **Condition of Schools in the Revitalization/Expansion Queue**

From our perspective, the OLO report falls short in describing the condition of MCPS' older schools. These conditions frequently make rebuilding these facilities the only feasible and cost-effective approach.

As we have informed the County Council in the past, our current revitalization/expansion program is addressing schools constructed in the 1960s and 1970s, when MCPS was responding to rapidly increasing enrollment caused by the Baby Boom. In a 20-year period from 1952 to 1972, enrollment increased by almost 100,000 students and MCPS opened 158 schools. Unfortunately, the pace of growth and limited funds resulted in poor construction quality. Major improvements to school construction methods have been in place since the mid-1980s.

Challenging conditions at older schools include low ceiling heights that make it impossible to install duct work and wiring that meet today's standards. Also, structural systems frequently consist of block bearing walls with wood trusses, making reconfiguration of spaces extremely difficult and expensive. In addition, new building codes and environmental requirements make salvaging portions of older facilities difficult, if not impossible.

**Office of the Superintendent of Schools**

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As enrollment grows in MCPS, there also is the need to add capacity at most older schools. Site constraints and environmental requirements make it nearly impossible to add capacity and space to single-level schools. That means that efforts to increase capacity in a more compact manner must be accomplished through multi-story structures. However, our older schools typically cannot support additional floors due to poor construction. All of these conditions support our rebuilding approach to revitalization and expansion projects at this time. As we begin revitalization/expansion projects in schools built in the 1980s, the quality of the construction will allow us to take a different approach and not likely require as much rebuilding.

### **The Focus on Cost Effectiveness**

It is critically important to note that MCPS always pursues the most cost-effective approach to capital projects, including the revitalization/expansion of schools. Unfortunately, the OLO report leaves the impression that the share of capital expenditures for the revitalization/expansion program is out of proportion with funds spent on new schools, classroom additions, and systemic maintenance projects. Importantly, the revitalization/expansion program itself comprehensively *adds* capacity and addresses systemic maintenance issues. The program accomplishes these improvements in a more cost-effective manner than separate projects to build classrooms and replacing obsolete building systems one at a time. During the past five Fiscal Years (FY) (FY 2012 through FY 2016), 17 of the 19 completed revitalization/expansion projects have increased the capacity of the schools, adding 180 classrooms that provide more than 4,000 seats for students. In addition, these new buildings had more effective, efficient systems that reduced maintenance and utility costs and lessened the environmental impact of our schools.

Another important point overlooked in the OLO report has to do with the progress MCPS is making in bringing Baby Boom-era schools up to modern standards. MCPS now is nearly midway through the upgrading of these schools. Once these schools are brought up to modern standards, a longer life span can be expected. Thereafter, the share of capital funds in the revitalization/expansion program will become smaller and systemic maintenance projects that extend the useful life of schools will continue to play a larger role.

The State of Maryland Public School Construction Program (PSCP) requires feasibility studies to determine the most cost-effective approach to upgrading aging facilities. The state guidelines define these projects as new construction, renovations, limited renovations, and replacements. In order to obtain state funding, Maryland requires school systems to provide a thorough cost analysis to justify replacement of a facility. All cost analyses submitted by MCPS for school replacements have been accepted by the state of Maryland and have served as justification for state funding—an important indicator that the state endorses our approach as the best course of action.

It also needs to be noted that not all revitalization/expansions completely rebuild schools. When the feasibility study conducted at the outset of the project indicates that it is cost effective to retain the existing structure, this approach is selected. In fact, over the past 15 years, about one-third of the district's 38 revitalization/expansion projects retained existing structures in lieu of a complete rebuild. This includes projects at Chevy Chase, Galway, Mill Creek Towne, Rock Creek Valley, and Wood Acres elementary schools; Montgomery Village, Parkland and Earle B. Wood middle schools; and Bethesda-Chevy Chase, Winston Churchill, Walter Johnson, and Rockville high schools. This likely will occur more frequently when MCPS begins revitalization/expansion projects on schools constructed in the 1980s.

Finally, the OLO report’s effort to draw comparisons between the MCPS revitalization/expansion program and similar programs in other school districts ignores the additional local and state constraints that our projects must meet. For instance, MCPS is bound by the state of Maryland’s Stormwater Management Program and the United States Green Building Council certification standards. These legislative requirements are designed to reduce runoff by limiting impervious surfaces and discourage large single-story footprint structures, including schools. These are worthy goals; however, they do increase the cost of our projects compared to other districts. For instance, Fairfax County Public Schools routinely builds additional square footage adjacent to existing buildings, which is something that MCPS frequently cannot do. Thus, these are not proper comparisons.

**Summary**

MCPS appreciates the issues raised in the report, although we are concerned that the OLO report does not adequately take into account how the original construction methods, and current enrollment levels, of aging schools make the MCPS revitalization/expansion program the most cost-effective and feasible approach. The OLO report does not recognize PSCP support for the MCPS revitalization/expansion program, as evidenced by its funding of schools that have been rebuilt. This is an important part of the discussion that we look forward to having in the future.

Our concerns notwithstanding, we welcome OLOs collaboration and review of our capital program. Two of the findings in the report will certainly assist our improvement efforts. First, the report identifies some errors made by a consultant in the scoring of schools using the FACT Assessment, and second, we will examine the issue of how conditions may change at schools between the time of their assessment and their revitalization/expansion. As the report notes, changes in condition are more likely the longer schools await revitalization/expansion—a likely outcome given recent funding levels. These are important findings for MCPS to consider, and they will be addressed in my *Recommended FY 2017 Capital Budget and FY 2017–2022 Capital Improvements Program*, which will be released in October 2015.

We look forward to continuing our conversations about this important topic with the County Council and our MCPS stakeholders.

Sincerely,

Larry A. Bowers  
Interim Superintendent of Schools

LAB:AMZ:sln

Copy to:

- Mr. Leggett
- Mr. Leventhal
- Members of the Board of Education
- Dr. Navarro
- Dr. Statham
- Dr. Zuckerman

- Mr. Crispell
- Ms. Karamihas
- Mr. Song
- Mr. Ikheloa
- Ms. Bryant
- Mr. Trombka

# **APPENDIX A**

**EXAMPLE MCPS FEASIBILITY STUDY PROCESS  
BROWN STATION ELEMENTARY SCHOOL**

# **APPENDIX A**

## **EXAMPLE MCPS FEASIBILITY STUDY PROCESS BROWN STATION ELEMENTARY SCHOOL (provided by MCPS)**

A feasibility study for Brown Station Elementary School reviewed several options that included total replacement with a 3 story option, total replacement with a 2 story option, and existing building modernization with additions. These options were reviewed by the design team and discussed with the community. A life cycle cost comparison was performed to assess all options as well as a programmatic evaluation for advantages and disadvantages. The results of this work are outlined below:

Brown Station Elementary School is a one story school. The existing structure is sprinklered and exterior walls and interior partitions are primarily masonry. The structural system consists of block bearing walls with wood trusses and concrete floor slabs on grade. Currently, the building's square footage is about 20,000 sf less than the educational specifications square footage requirement. The site is small – only 9 acres, 7 of which is usable.

Generally, the property slopes from the north to the south and southwest. The property is relatively flat in the areas immediately surrounding the building; however, large retaining walls along northern and western property boundaries combine to reduce the impacts of the natural topography. Storm water management improvements and modifications will be required to accommodate the modification and revised site conditions.

### **OPTION 1 - ADVANTAGES**

- The separation of the buses from the cars is successful.
- The size of the fields in this option is the largest of the three options.
- The administration area has a good view of both drop-off areas.
- The three story school is a relatively unique feature and could potentially be a source of school pride.
- This option “spreads out” the kids from each other. The staff views this as a benefit.
- This is the only option that accommodates the full educational specification site requirements.
- The future classroom location is in a convenient location.
- The future portable location is ideal as it does not occupy hard play areas.
- Two levels of the school have ground floor access. This a benefit, especially in an elementary school with a PEP program.
- The gym is acoustically isolated.

### **OPTION 1 - DISADVANTAGES**

- With 3 levels, there is less flexibility regarding classroom groupings when compared to a two level school.

### **OPTION 2 - ADVANTAGES**

- The separation of the buses from the cars is successful.
- The size of the fields in this option is adequate.

### **OPTION 2 - DISADVANTAGES**

- The walk from the entrance to the farthest classroom is quite long.
- The location of the future classrooms is not ideal as it will require the contractors using the fields to gain access to that area of the school.

### **OPTION 3 - ADVANTAGES**

- The “loop” circulation is a benefit according to the staff.

### **OPTION 3 - DISADVANTAGES**

- This option provides the smallest area for open space on the site.
- This option is difficult to resolve architecturally.
- This option will be particularly challenging due to the low ceiling heights of the existing school due to the wood trusses.

All of the options evaluated have the ability to provide the required spaces in the building portion of the educational specification; however, Option 3 will not meet the educational specification site requirements. In addition, Option 2 was not well received by the school staff because of the distance between the entrance and the farthest classroom.

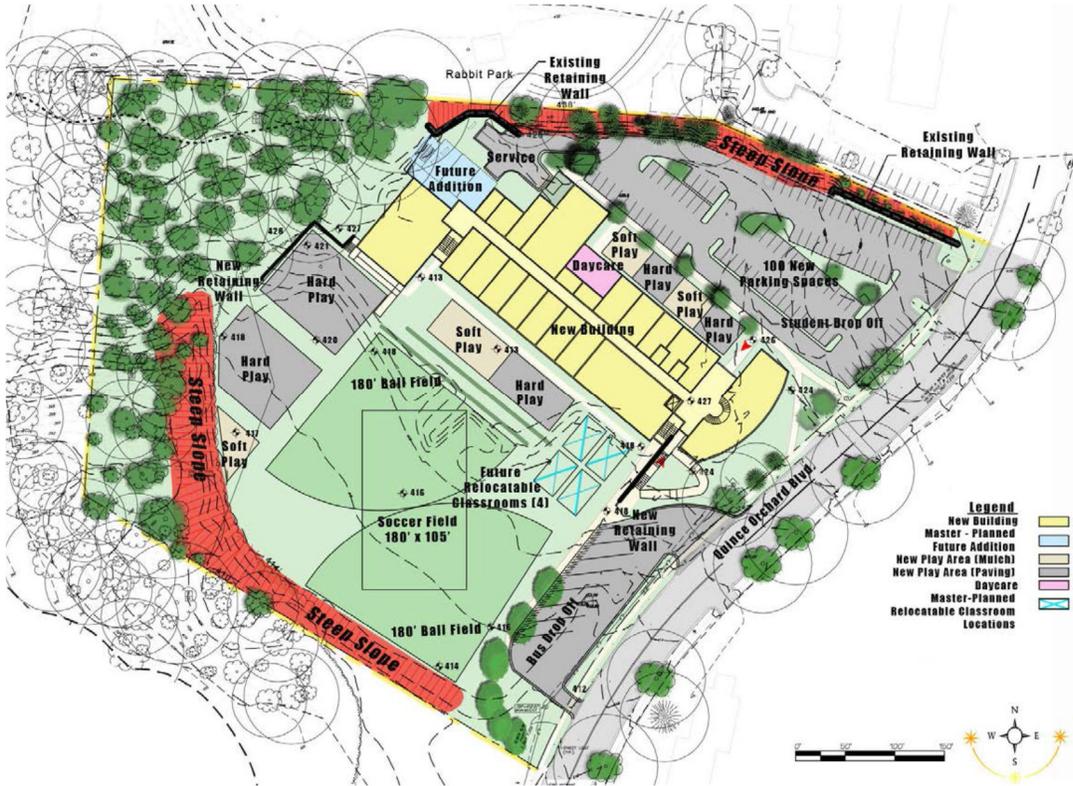
The building, parking lot and fields are all in similar locations in all of the options. The most significant differences between the options include the amount of school to be retained, the site circulation and the number of stories of the final design.

Neither the community nor the school staff liked Option 3 due to the site challenges it proposed, being a relatively large footprint on a small site and the remoteness of the new parking lot. In addition, the existing structure is wood and the existing school has low ceilings which would dictate a less efficient mechanical upgrade design. While Options 1 and 2 received a favorable response, it was determined that the priority of both the staff and the community is for the modernized school to have the smallest footprint possible to allow for the largest play area possible. This led the Feasibility Study participants to recommend Option 1 be implemented.

In accordance with the consensus of the Feasibility Study participants, it is recommended that Option 1, as depicted herein, and its associated site improvements, be implemented. Only Option 1 improves the overall function of the building and site and fulfills all MCPS Program Requirements.

ELEMENT	OPTION 1 Total Replacement - 3 Story Option			OPTION 2 Total Replacement - 2 Story Option			OPTION 3 Addition and Modernization		
	Quantity (SF)	Unit Cost (\$)	Item Cost (\$)	Quantity (SF)	Unit Cost (\$)	Item Cost (\$)	Quantity (SF)	Unit Cost (\$)	Item Cost (\$)
<b>Construction Contingency</b>									
New Construction (Base Building)	95,114	\$205.00	\$19,498,370	93,228	\$205.00	\$19,111,740	53,221	\$205.00	\$10,910,305
Modernization Construction	-	\$200.00	\$0	-	\$200.00	\$0	44,619	\$200.00	\$8,923,800
Demolition	58,338	\$11.00	\$641,718	58,338	\$11.00	\$641,718	13,719	\$11.00	\$150,909
Site Costs		LS	\$1,935,000		LS	\$1,975,000		LS	\$2,036,000
Hazardous Materials Abatement	58,338	\$7.00	\$408,366	58,338	\$7.00	\$408,366	58,338	\$7.00	\$408,366
<b>Construction Contingency Subtotal</b>			<b>\$22,483,454</b>			<b>\$22,136,824</b>			<b>\$22,429,380</b>
<b>Related Construction Costs</b>									
Utilities / Permits			\$0			\$0			\$0
LAN/DATA/CATV/PAT/Telephone/Security			\$275,000			\$275,000			\$275,000
Equipment & Furnishings			\$1,000,000			\$1,000,000			\$1,000,000
<b>Related Construction Cost Subtotal</b>			<b>\$1,275,000</b>			<b>\$1,275,000</b>			<b>\$1,275,000</b>
<b>Construction Contingency</b>									
New Construction	\$19,498,370	4.25%	\$828,681	\$19,111,740	4.25%	\$812,249	\$10,910,305	4.25%	\$463,688
Modernization Construction	\$0	8.0%	\$0	\$0	8.0%	\$0	\$8,923,800	8.0%	\$713,904
Site Costs	\$1,935,000	4.5%	\$87,075	\$1,975,000	4.5%	\$88,875	\$2,036,000	4.5%	\$91,620
Hazardous Materials Abatement	\$408,366	10.0%	\$40,837	\$408,366	10.0%	\$40,837	\$408,366	10.0%	\$40,837
Other Construction Costs	1,275,000	4.5%	\$57,375	\$1,275,000	4.5%	\$57,375	\$1,275,000	4.5%	\$57,375
<b>Construction Contingency Subtotal</b>			<b>\$1,013,967</b>			<b>\$999,336</b>			<b>\$1,367,424</b>
<b>Project Planning Costs</b>									
A/E Design Fee			\$1,177,500			\$1,177,500			\$1,177,500
Printing Expenses			\$20,000			\$20,000			\$20,000
EMS Design Fee			\$75,000			\$75,000			\$75,000
Technology Design Fee			\$70,000			\$70,000			\$70,000
Topographic/Boundary Survey			\$50,000			\$50,000			\$50,000
Sub-surface utility survey			incl in geotechnical			incl in geotechnical			incl in geotechnical
Geotechnical Investigation			\$12,000			\$12,000			\$12,000
Traffic Study			\$15,000			\$15,000			\$15,000
Energy Study			\$50,000			\$50,000			\$50,000
Existing Condition Study			\$25,000			\$25,000			\$25,000
Environmental Impact Study			\$25,000			\$25,000			\$25,000
<b>Project Planning Cost Subtotal</b>			<b>\$1,519,500</b>			<b>\$1,519,500</b>			<b>\$1,519,500</b>
<b>Maintenance &amp; Operating Costs</b>									
Maintenance Costs	95,114	\$1.48	\$140,769	93,228	\$1.48	\$137,977	97,840	\$1.48	\$144,803
Operating Costs	95,114	\$2.50	\$237,785	93,228	\$2.50	\$233,070	97,840	\$2.50	\$244,600
Utility Costs	95,114	\$2.00	\$190,228	93,228	\$2.00	\$186,456	97,840	\$2.00	\$195,680
<b>Maintenance &amp; Operating Cost/Year Sub-Total</b>			<b>\$568,782</b>			<b>\$557,503</b>			<b>\$585,083</b>
<b>Net Present Value of M/O Costs for 40 Year Life Cycle Cost</b>			<b>\$22,751,269</b>			<b>\$22,300,138</b>			<b>\$23,403,328</b>
<b>Total Investment Cost</b>			<b>\$49,043,190</b>			<b>\$48,230,797</b>			<b>\$49,994,632</b>

Option 1



Option 2



Option 3

