



Montgomery Planning | Functional Planning & Policy Division

# School Planning 101

Intro to School Capacity Planning





# Presentation Outline

- General Overview of Schools
- CIP and Enrollment/Capacity Projection Process
- Subdivision Staging Policy

# General Overview of Schools

# Overview of Schools in Montgomery Co.

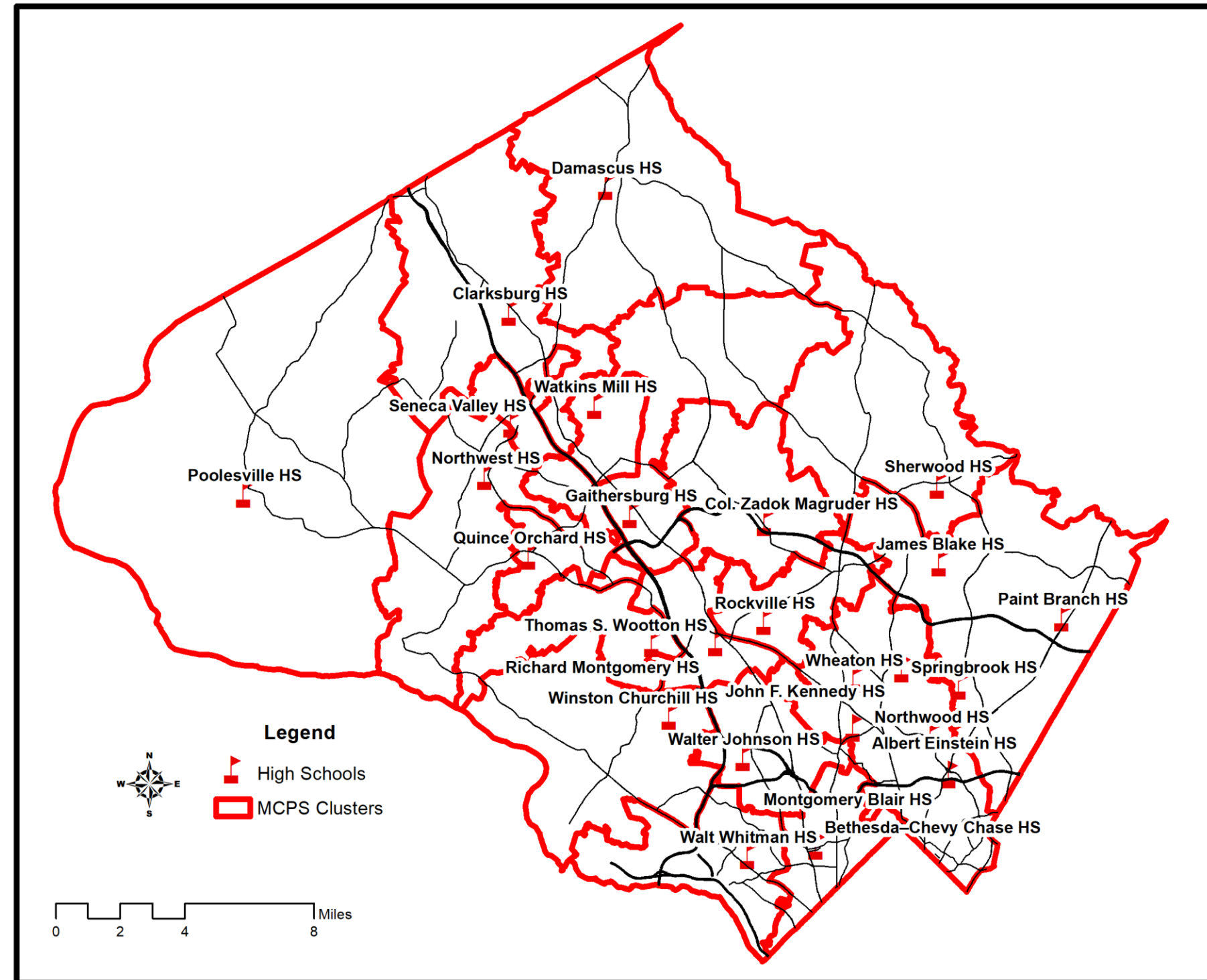
- 25 geography based “clusters” defined by high school boundaries
- Most students assigned to their school via their home address
- Some options allow students to go to unassigned schools
  - Choice programs: Magnet, Language, Consortia
  - Special needs programs: some types of special ed, gifted ed
  - Change of school assignment (COSA)

\*163,000 Students\*

\*206 Schools\*

\*14<sup>th</sup> Largest System in U.S.\*

# Clusters Defined by High Schools

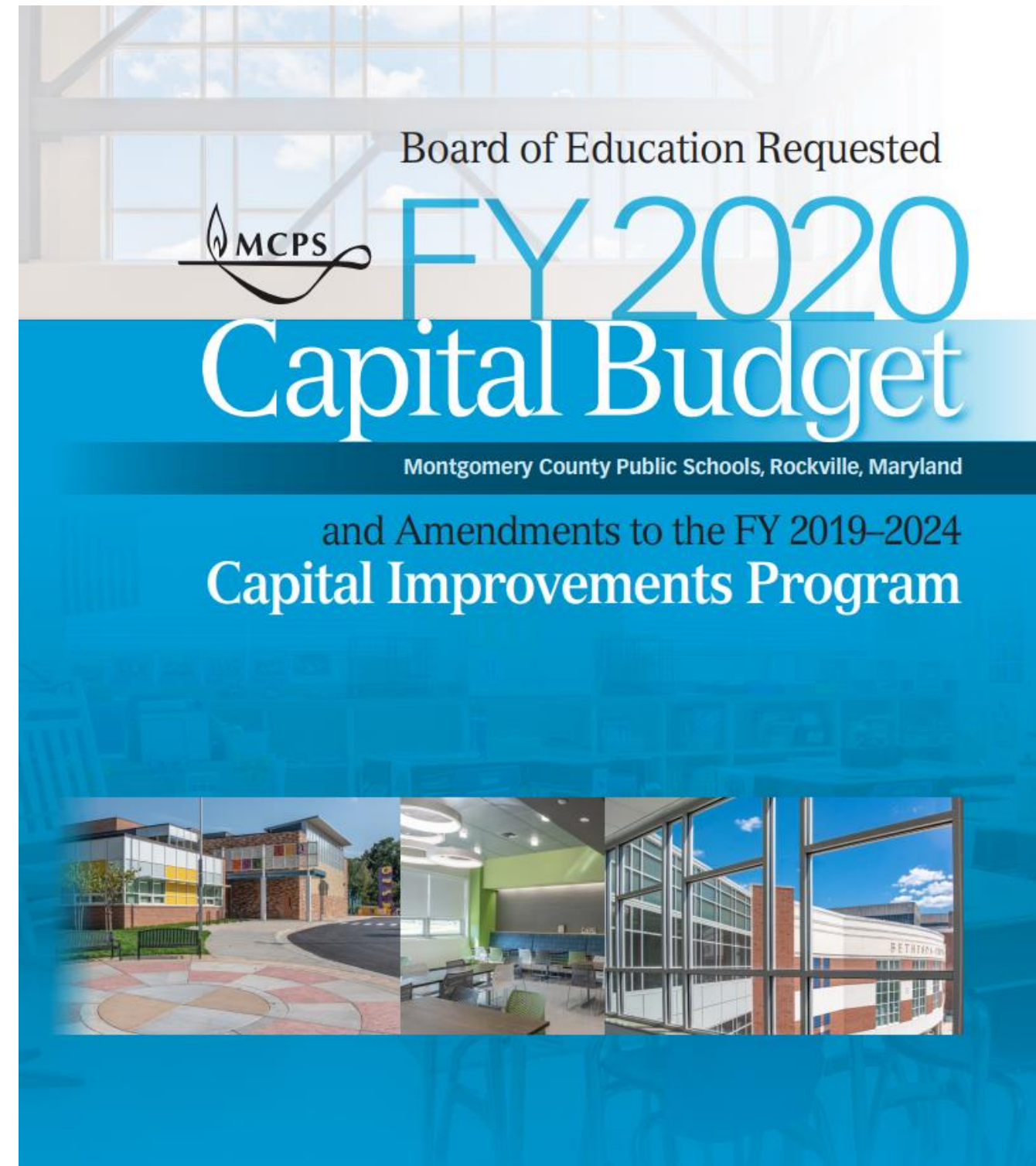


# CIP and Enrollment/Capacity Projection Process

# MCPS Division of Capital Planning

## MCPS / Board of Education

- plans school construction
- plans boundary changes
- selects school sites
- has its own capital budget
- has community processes



# Two-Year CIP Cycle Defines Planning Tasks

## Every Year:

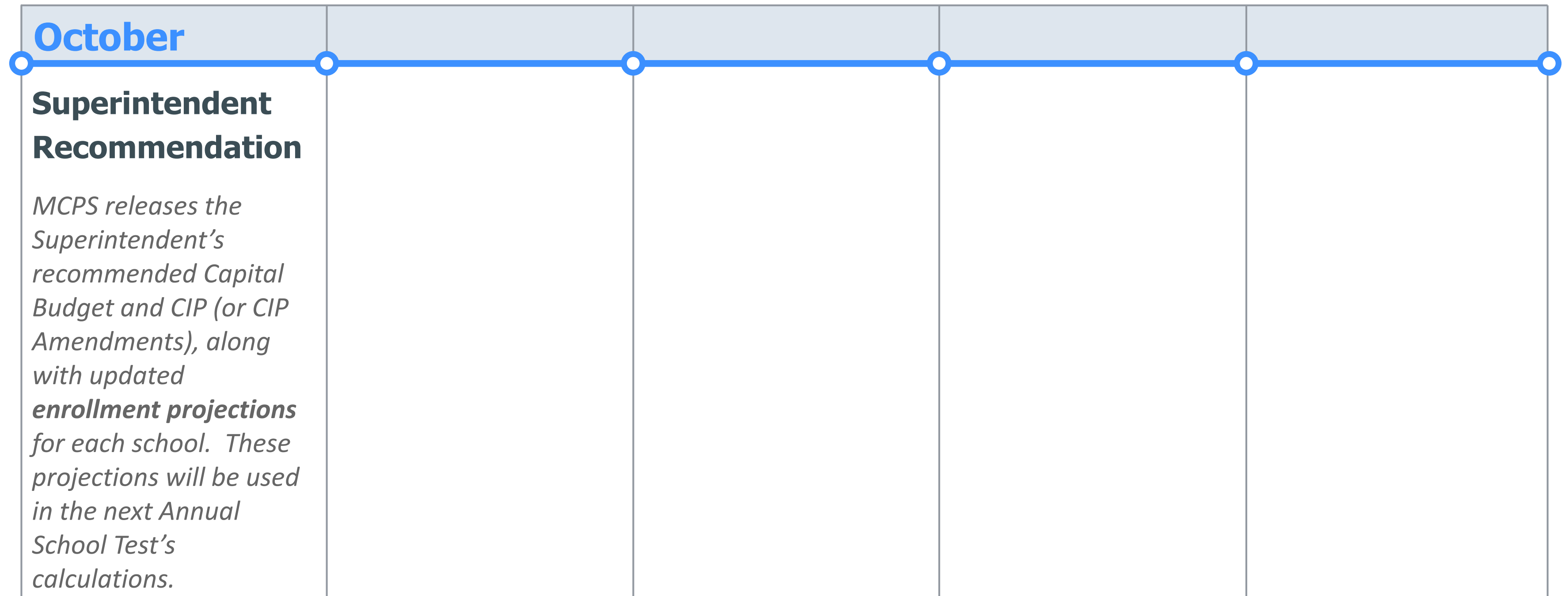
- School enrollment projected
- School capacity projected
- Capital budget approved
- School projects are planned, designed, built

## Alternating Years:

- Full CIP approved/  
Amended CIP approved



# Process Timeline



# School Planning Issue Descriptions

## DOWNCOUNTY CONSORTIUM

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### **Montgomery Blair High School**

**Capital Project:** To address the urgent space needs in the Downcounty Consortium high schools, an FY 2019 appropriation was approved to begin planning to provide the instructional support spaces needed for 2,700 students at Northwood High School. With respect to Northwood High School, an internal analysis has been completed that evaluated a) the possibility of doing a phased construction of Northwood High School, with students on site and b) an approach where a newly constructed and reopened Woodward High School be used as a holding school, starting in September 2023, for Northwood High School for two years. The evaluation compared the costs for each option, impact to students, impact on the building design, and the timeline of the project. This evaluation will be presented to the Board of Education during the CIP process in November 2018, for consideration and action on the approach for Northwood High School.

### **Sargent Shriver Elementary School**

**Planning Issues:** Projections indicate that enrollment will exceed capacity by 92 seats or more by the end of the six-year planning period. Given that a new forecast methodology has been implemented this year, enrollment will be monitored to determine if a capacity solution is needed in a future CIP.

### **Woodlin Elementary School**

**Capital Project:** As a result of the capacity study described earlier, the Board of Education approved an addition project at Woodlin Elementary School. Furthermore, building systems need to be addressed in the facility. Therefore, as part of the approved addition project, facility upgrades will be designed to address the building systems. An FY 2019 appropriation was approved to begin the architectural design and planning for this project with a scheduled completion date of September 2022. In order for this project to be completed on this schedule, county and state funding must be provided at the levels recommended in this CIP.

# Board Policy FAA

- Guides the educational facilities planning process in an efficient and fiscally responsible way to meet the varied educational needs of MCPS students with consideration of environmental sustainability.
- Designed to promote public understanding of MCPS educational facilities planning processes and ensure that there are opportunities for input from parents/guardians, students, staff, community members and organizations, local government agencies, and municipalities.

FAA

POLICY

BOARD OF EDUCATION  
OF MONTGOMERY COUNTY

Related Entries:

ABA, ABC, ABC-RA, ACA, ACD, ACG, ACG-RA, ACG-RB, DNA, ECM, ECM-RA, FAA-RA, JEE, JEE-RA

Responsible Office:

Chief Operating Officer

Educational Facilities Planning

A. PURPOSE

To affirm the Montgomery County Board of Education's commitment to continuing to provide high-quality facilities that support the educational programming needed to ensure that every Montgomery County Public Schools (MCPS) student is well-prepared for success consistent with the Board's core values of Learning, Relationships, Respect, Excellence, and Equity

To establish an educational facilities planning process that effectively anticipates MCPS educational facility needs and establishes a framework for making equitable and fiscally responsible facility decisions in an uncertain future, while considering instructional program priorities, physical condition of the schools, and the impact of under- or overutilized facilities on the educational program

To promote public understanding of MCPS educational facilities planning processes and provide opportunities for stakeholders to engage in, inform, and respond to those processes

To coordinate MCPS facilities planning processes with those of other units of local governments and municipalities in Montgomery County

B. BACKGROUND

Educational facilities planning is essential to identify the infrastructure needed to ensure success for every student. The Board has primary responsibility to plan for educational facilities that sustain high-quality MCPS educational programs while effectively responding to changes in student enrollment, educational programming, and physical plant infrastructure.

1 of 9

Source: MCPS Board Policy FAA



# Triggering School Facility Projects

- Capacity Utilization and Seat Deficit/Surplus
  - Student Enrollment – Current Actual vs. Projected
  - Program Capacity – Current Actual vs. Projected

**Capacity Utilization Rate = Enrollment ÷ Capacity**

Blair HS Utilization Rate = 3,619 students ÷ 2,912 seats  
= 124.3%

**Seat Deficit/Surplus = Capacity – Enrollment**

Blair HS Seat Deficit = 2,912 seats - 3,619 students  
= -707 seats

# Triggering School Facility Projects

- Key Facility Indicators
  - Characteristics that influence the learning and working experience, such as safety, security, and accessibility requirements; indoor environment conditions; program and space relationships; building quality; as well as infrastructure and asset data, and other relevant characteristics.
  - Used to identify and provide a basis for prioritizing options responsive to changing facility needs

Source: MCPS Board Policy FAA

# Plans for When Overutilization Happens

What Might Happen:

- Use “relocatable” classrooms
- Boundary Study
- Study the problem
  - Capacity Study
  - Feasibility Study
  - Site Selection
- Recommend a capital project

*How large and consistent do seat deficits at a school have to be to trigger the capacity planning process?*



# Types of Capacity Projects

- School building additions
  - Includes a feasibility study and schematic design process
- New school buildings (or re-opened school buildings)
  - Implies a boundary study
  - Implies a site selection process to determine location
  - Includes a schematic design process
- School boundary study to reassign students to less utilized schools

# Projected Enrollment & Space Availability Tables

Schools			Actual 18-19	Projections							
				19-20	20-21	21-22	22-23	23-24	24-25	2028	2033
Montgomery Blair HS		Program Capacity	2912	2912	2912	2912	2912	2912	2912	2912	2912
		Enrollment	3215	3181	3262	3342	3406	3522	3619	3643	3820
		Available Space	(303)	(269)	(350)	(430)	(494)	(610)	(707)	(731)	(908)
		Comments									
Col. E. Brooke Lee MS		Program Capacity	727	727	727	1000	1000	1000	1000	1000	1000
		Enrollment	760	769	792	825	837	869	885	993	1040
		Available Space	(33)	(42)	(65)	175	163	131	115	7	(40)
		Comments	Planning for Addition/Facility Upgrade			Addition/Facility Upgrade Complete					

# Enrollment Projections

- Four Model Methodology
  - Average % Annual Increase Model
  - Linear Regression Model
  - Cohort Survival Model
  - Students-per-Household Model
- Each model generates student count estimates by grade for each school
- Weighted average generated for each school
- Six years of projections, plus 10-year and 15-year for secondary schools

## Appendix C-2

### MCPS Enrollment Forecasting

The prediction of school enrollment involves the consideration of a wide range of factors. The makeup of communities is the foremost consideration. In addition, characteristics of schools, such as the programs offered and changes within school service areas (such as new housing), can influence enrollment. Economic activity at the local, regional, and national levels also influences the accuracy of enrollment forecasts. Developing a forecast that extends from 1 to 15 years requires assessment of current local events in light of broader, long-term trends. Forecast accuracy varies depending on the geographic scope of the projection as well as its time span. Accuracy is greatest when enrollment is projected for large areas for the short-term (one or two years in the future). Accuracy in forecasts diminishes as the geographic area projected becomes smaller and as the forecast is made for more distant points in the future. Therefore, a one-year countywide forecast for total enrollment for all schools will have less error than forecasts that extend further into the future for individual schools.

The MCPS enrollment forecast is developed after an annual study of trends at the county and individual school levels. The grade enrollment history of each school is compiled and updated annually. MCPS projections, prepared in the fall of every year, extend through the upcoming ten years for all schools and the fifteenth year in the future for secondary schools. The preliminary September enrollment at each school is used as the basis from which projections are developed. Enrollment projections are merely an estimate of future activity based on the historical data and information reviewed. As demonstrated by the calculations over the past ten years, there can be constant variations in growth. Although these numbers can be highly accurate, it must be remembered that the numbers are still a projection or estimate. It is important to reassess these numbers on an annual basis and adjust capital and non-capital plans accordingly.

During the 2017–2018 school year, the school system worked with an external consultant to develop a new enrollment forecasting methodology. This new methodology allows staff to understand the different factors that affect student enrollment at the individual school level and will allow the school system to identify trends and prepare for adequate space as well as teaching staff and materials. The new methodology includes the following four models: average percentage annual increase; cohort survival; linear regression; and student-per-housing unit models. A weighted average is generated of these four models for each school to develop the enrollment projection. A brief description of each of the four models follows.

#### Average Percentage Annual Increase Model

This model calculates future school enrollment growth based on the historical average growth from year to year for each grade level. This simple model multiplies the historical average percentage increase (or decrease) by the prior year's enrollment to project future enrollment estimates.

#### Linear Regression Model

This model uses a statistical approach to estimate an unknown future value of a variable by performing calculations on known historical values. Once calculated, future values for different future dates can be plotted along a "regression line" or "trend line". A "straight-line" regression model to estimate future enrollment values, a model that finds the "best fit" based on the historical data is used.

#### Cohort Survival Model

This model calculates the growth or decline between grade levels over a period of ten years based on the ratio of students who attend each of the previous years, or the "survival rate". This ratio is then applied to the incoming class to calculate the trends in that class as it "moves" or graduates through the school system. The determination of future kindergarten enrollment estimates is critical, especially for projections exceeding more than five years. A model based on the correlation between historical resident birth rates (natality rates) and historical kindergarten enrollment five years later is used.

#### Students-Per-Household Model

This model utilizes the estimated number of housing units as its base data. Using the cluster level housing unit and student generation factors from the county, a projected enrollment for the cluster is generated. These projections are then divided up to individual schools in the cluster based on each schools' overall enrollment contribution to the total number of students in the cluster (by grade band K–5, 6–8, 9–12).

Once each of these four base models has been calculated, a weighted average of each of the models is generated for each school. A weighted average provides an analysis to reflect all the trends observed in the historical data and the over-arching themes from the qualitative information gathered in this process. The weighted average also works to maximize the strengths of each of the "base" models.

Because of the uncertainty that surrounds both short- and long-range forecasts, MCPS forecasts are revised each fall. In addition, the one-year forecast is revised each spring. The primary purpose of evaluating the upcoming school year forecast is to increase the



# Capacity Calculations

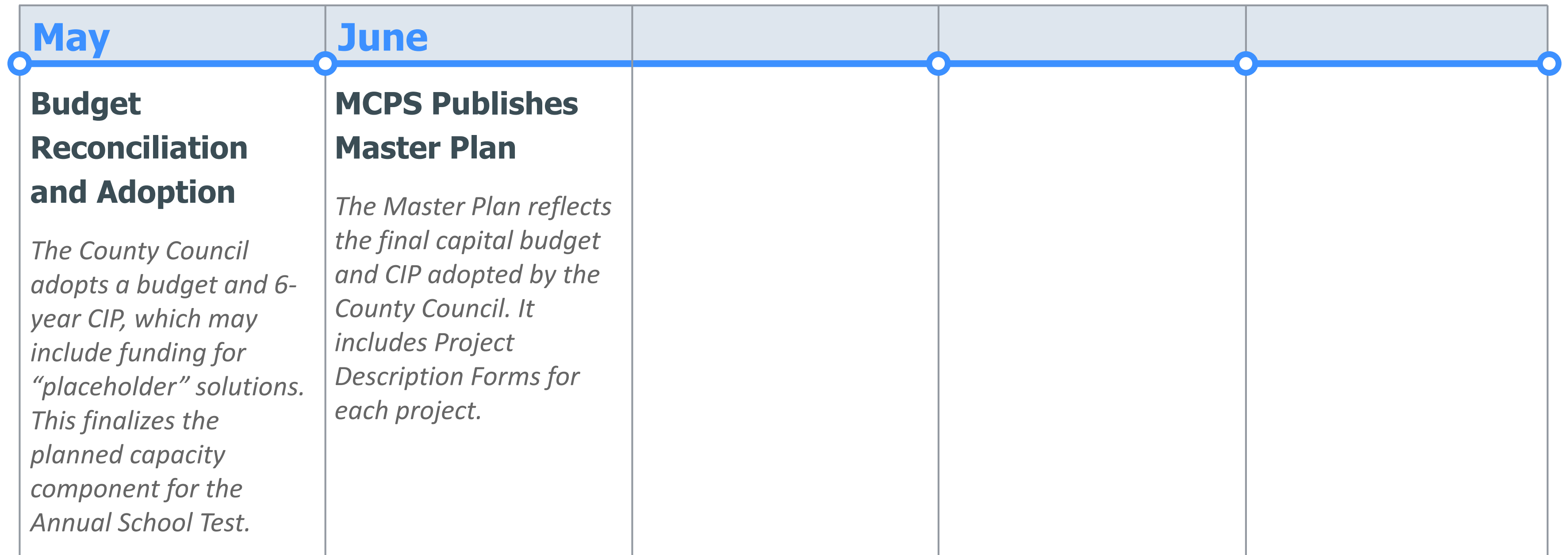
- Based on the programs in the schools and the amount of space they require:

Grade K	22:1
Grades K-2 (reduced class size schools)	18:1
Grades 1-5	23:1
Grades 6-8	21.25:1
Grades 9-12	22.5:1

# Process Timeline

October	November	December	January	February
<b>Superintendent Recommendation</b> <i>MCPS releases the Superintendent's recommended Capital Budget and CIP (or CIP Amendments), along with updated <b>enrollment projections</b> for each school. These projections will be used in the next Annual School Test's calculations.</i>	<b>Public Hearings</b> <i>The Board of Education receives written and oral testimony from residents, students and other stakeholders. The Board then holds work sessions to prepare its request.</i>	<b>BOE Request</b> <i>The Board of Education submits its Capital Budget and CIP request to the County Executive and County Council.</i>	<b>CE Proposal</b> <i>The County Executive combines all County agency budget and CIP requests and submits his/her proposed Capital Budget and CIP to the County Council.</i>	<b>Committee Work Sessions</b> <i>The County Council begins committee work sessions to review affordability issues, request non-recommended reductions, and make recommendations to the full Council.</i>

# Process Timeline





# Project Description Form

- Identifies the timing and phasing of the project and its funding
- Identifies the source of the funds
- Describes the project, including the number of classrooms/seats to be added

Col. E. Brooke Lee MS Addition/Facility Upgrade  
(P651910)

Category

Montgomery County Public Schools

Date Last Modified

05/17/18

SubCategory

Individual Schools

Administering Agency

Public Schools

Planning Area

Kemp Mill-Four Corners and Vicinity

Status

Preliminary Design Stage

	Total	Thru FY17	Est FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
EXPENDITURE SCHEDULE (\$000s)											
Planning, Design and Supervision	3,921	-	-	3,921	1,568	1,177	764	392	-	-	-
Site Improvements and Utilities	8,927	-	-	8,927	-	6,005	2,232	-	-	-	-
Construction	43,296	-	-	43,296	-	8,653	20,286	14,327	-	-	-
Other	1,750	-	-	1,750	-	-	525	1,225	-	-	-
TOTAL EXPENDITURES	57,864	-	-	57,864	1,568	16,525	23,827	15,944	-	-	-

	Total	Thru FY17	Est FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
FUNDING SCHEDULE (\$000s)											
G.O. Bonds	57,864	-	-	57,864	1,568	16,525	23,827	15,944	-	-	-
TOTAL FUNDING SOURCES	57,864	-	-	57,864	1,568	16,525	23,827	15,944	-	-	-

	Total	Thru FY17	Est FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
OPERATING BUDGET IMPACT (\$000s)											
Maintenance				306	-	-	-	102	102	102	-
Energy				114	-	-	-	38	38	38	-
NET IMPACT				420	-	-	-	140	140	140	-

	Total	Thru FY17	Est FY18	Total 6 Years	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	Beyond 6 Years
APPROPRIATION AND EXPENDITURE DATA (\$000s)											
Appropriation FY 19 Request	3,921										
Appropriation FY 20 Request	52,198										
Cumulative Appropriation	-										
Expenditure / Encumbrances	-										
Unencumbered Balance	-										

PROJECT DESCRIPTION

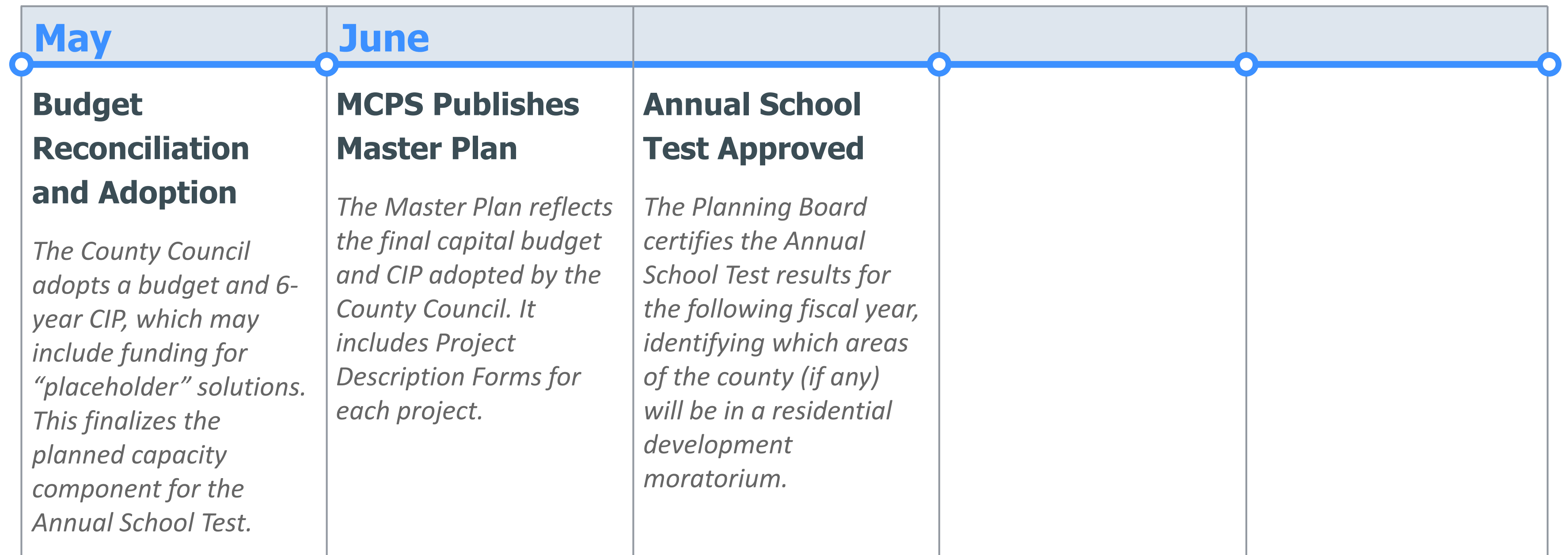
Projections indicate that enrollment at Col. E. Brooke Lee Middle School will exceed capacity by 246 seats by the end of the six-year planning period. The approved CIP included an addition for this school, as well as future expenditures for a revitalization/expansion project. The addition project also will require reconfiguration of existing spaces and building systems upgrades to accommodate the larger numbers of students. Therefore, the Board of Education's requested FY 2019-2024 CIP included that the scope of the addition project be expanded to include these infrastructure and system upgrades while construction is on-site to make better use of fiscal resources. An FY 2019 appropriation was approved to begin planning this addition and facility upgrades project. This project is scheduled to be completed September 2021.

COORDINATION

Mandatory Referral - M-NCPPC, Department of Environmental Protection, Building Permits, Code Review, Fire Marshall, Department of Transportation, Inspections, Sediment Control, Stormwater Management, WSSC Permits

Project Description Forms • 6-25

# Process Timeline



# Subdivision Staging Policy

# Schools Component of the SSP

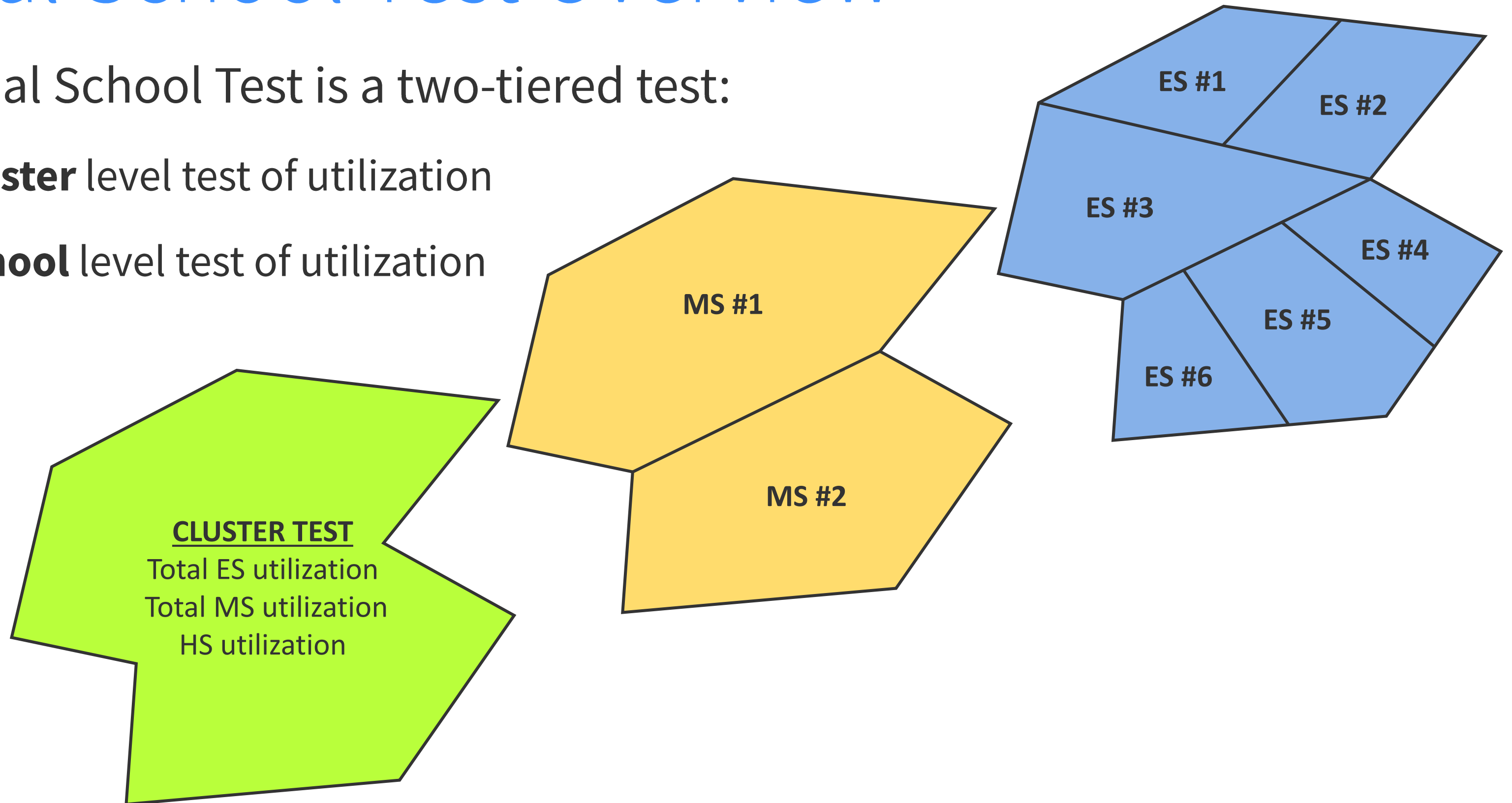
- Defines the **Annual School Test** for development application review
  - Provides the thresholds for “moratoria”
  - Determines whether “adequate” school facilities exist in a project area
- Is updated every 4 years
  - Thresholds and rules for reviewing school adequacy can be altered



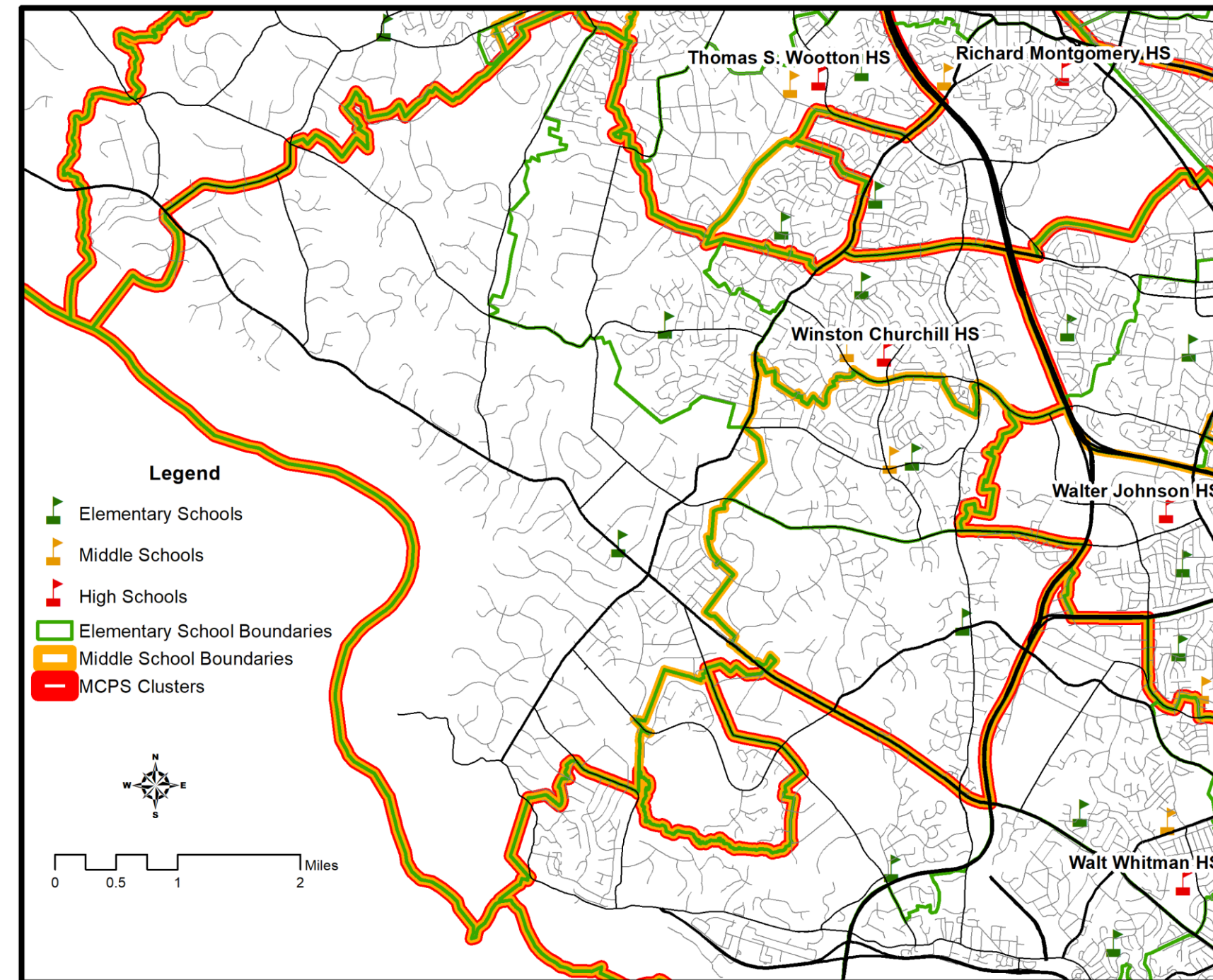
# Annual School Test Overview

The Annual School Test is a two-tiered test:

- **Cluster** level test of utilization
- **School** level test of utilization



# A Cluster Boundary Includes MS and ES Boundaries



# Annual School Test Thresholds

Inadequate if Cluster is over 120% utilization

- High School utilization
- Total utilization across all middle schools in Cluster
- Total utilization across all elementary schools in Cluster

Inadequate if school is over 120% utilization AND seat deficit is...

- 110 or more seats for elementary schools
- 180 or more seats for middle schools

# Utilization Examples

School Level	Projected <b>Gaithersburg Cluster</b> Totals, September 2024			Moratorium Threshold
	Enrollment	Program Capacity	% Utilization	
Elementary	4,694	4,668	100.6%	908
Middle	1,882	1,958	96.1%	467
High	2,764	2,429	113.8%	150

School	Enrollment	Projected <b>School</b> Totals, September 2024			Moratorium Threshold
		Program Capacity	% Utilization	Surplus/ Deficit	
Gaithersburg ES	804	788	102.0%	-16	142
Gaithersburg MS	942	1,009	93.4%	+67	269



# Utilization Data Adjustments in School Test

Adjustments to Test results occur when:

- School capacity projects will require future boundary changes (adjustments to enrollment are estimated)
- Placeholder projects are funded (“on paper” adjustments to capacity)

# Example of Adjustments – CIP Project

Cluster	School	2024-25 Enrollment	2024-25 Capacity	Modified Enrollment	Modified Capacity
Clarksburg	Clarksburg HS	2,848	2,034	2,321	2,034
		140.0% Utilization		114.1% Utilization	

Clarksburg HS service area is open conditionally due to an approved CIP project that will reassign students to Seneca Valley HS in September 2020.

The actual boundary change won't be decided by the Board of Education until fall 2019.

We estimate that the impact will be to relieve Clarksburg of 527 students, modifying the projected enrollment from 2,848 to 2,321 students.

# Example of Adjustments – Placeholder

Cluster	School	2024-25 Enrollment	2024-25 Capacity	Modified Enrollment	Modified Capacity
B-CC	Bethesda ES	731	560	731	698
		130.5% Utilization		104.7% Utilization	

The Council has included a 6-classroom placeholder project in the adopted CIP for Bethesda ES, which has kept the school's service area open conditionally.

23 seats per classroom x 6 classrooms = 138 additional seats

Bethesda ES projected capacity is modified to reflect the additional 138 seats, increasing from 560 to 698 seats.

# Process Timeline


May	June		July	
<b>Budget Reconciliation and Adoption</b> <i>The County Council adopts a budget and 6-year CIP, which may include funding for “placeholder” solutions. This finalizes the planned capacity component for the Annual School Test.</i>	<b>MCPS Publishes Master Plan</b> <i>The Master Plan reflects the final capital budget and CIP adopted by the County Council. It includes Project Description Forms for each project.</i>	<b>Annual School Test Approved</b> <i>The Planning Board approves the Annual School Test results for the following fiscal year, identifying which areas of the county (if any) will be in a residential development moratorium.</i>	<b>School Adequacy Reviews for new Fiscal Year</b> <i>New school test results are used to evaluate school adequacy for development applications during preliminary plan review.</i>	



# FY2020 Annual School Test

- Identified areas for a residential development moratorium for FY20
- Identified the amount of space available in each cluster and school before a moratorium would be triggered
- Based on projected utilization data for the 2024-25 school year (6-year projection)


**FY2020 Annual School Test - Service Area Status**

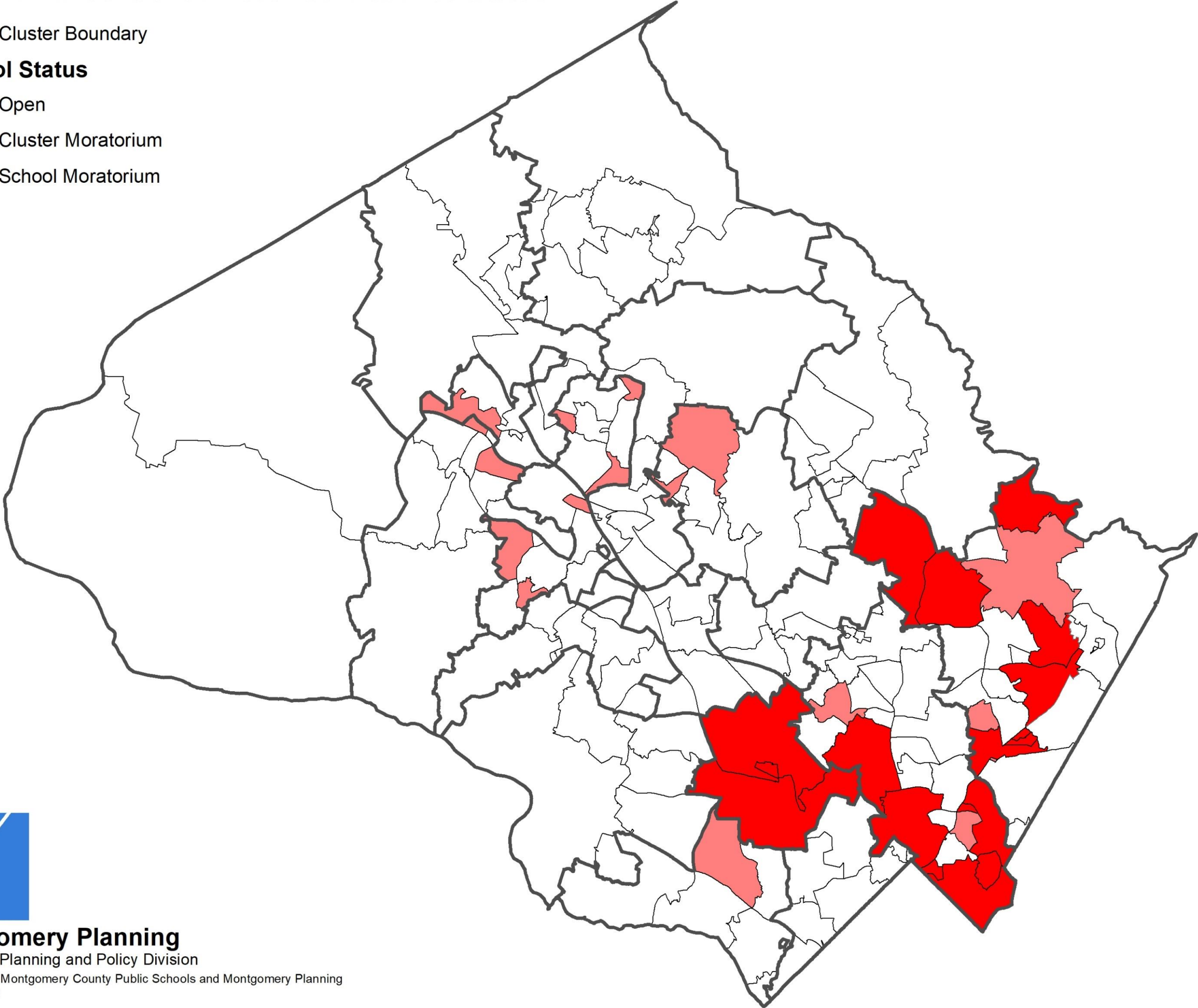
 Cluster Boundary

**School Status**

 Open

 Cluster Moratorium

 School Moratorium



**Montgomery Planning**

Functional Planning and Policy Division

Data Source: Montgomery County Public Schools and Montgomery Planning  
June 20, 2019

# Estimating Enrollment Impacts for a Development Application

- Project Location
  - Cluster & School-level Projected Utilization
  - Relevant Capacity Projects Affecting Projected Utilization
  - Placeholder Projects Affecting Projected Utilization
- Project Impact
  - Number of Expected Students = SGR x **NET** Dwelling Units by Housing Type
- Expected Planning Board Date

# Test Result Example

Subdivision with a net of 20 townhouse units and 150 multifamily (high rise) units in the Gaithersburg Cluster:

	Net Number of Units	ES Generation Rates	ES Students Generated	MS Generation Rates	MS Students Generated	HS Generation Rates	HS Students Generated
Single Family Attached	20	0.248	4.960	0.121	2.420	0.157	3.140
Multi-Family High Rise	150	0.020	3.000	0.008	1.200	0.010	1.500
<b>TOTALS</b>	<b>170</b>		<b>7</b>		<b>3</b>		<b>4</b>



# Test Result Example

## Cluster Level Test:

School Level	Projected Gaithersburg Cluster Totals, September 2024			Moratorium Threshold	Estimated Application Impact
	Enrollment	Program Capacity	% Utilization		
Elementary	4,694	4,668	100.6%	908	7
Middle	1,882	1,958	96.1%	467	3
High	2,764	2,429	113.8%	150	4

## School Level Test:

School	Enrollment	Projected School Totals, September 2024			Moratorium Threshold	Estimated Application Impact
		Program Capacity	% Utilization	Surplus/ Deficit		
Gaithersburg ES	804	788	102.0%	-16	142	7
Gaithersburg MS	942	1,009	93.4%	+67	269	3

# How Many Kids Live There?!

Student Generation Rates (SGRs) are an average of the number of students per type of dwelling unit.

## 2018 MCPS Student Generation Rates by Region and Housing Type

COUNTYWIDE STUDENT GENERATION RATES		ES	MS	HS	K-12
Countywide	Single Family Detached	0.199	0.110	0.154	0.462
	Single Family Attached	0.227	0.113	0.150	0.490
	Multi-Family Low to Med Rise	0.197	0.086	0.109	0.393
	Multi-Family High Rise	0.055	0.023	0.031	0.110

REGIONAL STUDENT GENERATION RATES		ES	MS	HS	K-12
<b>East</b>  Blair, Einstein, Kennedy, Northwood, Wheaton, Blake, Paint Branch and Springbrook clusters	Single Family Detached	0.203	0.103	0.144	0.450
	Single Family Attached	0.219	0.115	0.160	0.494
	Multi-Family Low to Med Rise	0.253	0.112	0.148	0.512
	Multi-Family High Rise	0.088	0.036	0.047	0.171
<b>Southwest</b>  Bethesda-Chevy Chase, Churchill, Walter Johnson, Richard Montgomery, Rockville, Whitman, and Wootton clusters	Single Family Detached	0.186	0.109	0.151	0.446
	Single Family Attached	0.167	0.085	0.111	0.363
	Multi-Family Low to Med Rise	0.150	0.068	0.085	0.303
	Multi-Family High Rise	0.041	0.018	0.025	0.084
<b>Upcounty</b>  Clarksburg, Damascus, Gaithersburg, Magruder, Northwest, Poolesville, Quince Orchard, Seneca Valley, Sherwood, and Watkins Mill clusters	Single Family Detached	0.210	0.120	0.169	0.499
	Single Family Attached	0.248	0.121	0.157	0.526
	Multi-Family Low to Med Rise	0.183	0.077	0.093	0.352
	Multi-Family High Rise	0.020	0.008	0.010	0.038

Rates are calculated using Fall 2018 enrollment data from Montgomery County Public Schools. Of the nearly 163,000 students enrolled in MCPS schools in Fall 2018, Planning Staff were able to match 99.4% of the students to a housing type.

# School Adequacy Beyond the Test

- Exemptions from moratoria imposed by the Annual School Test:
  - De minimis projects (three units or less) are exempt
  - Age-restricted senior housing are also exempt
  - A project estimated to generate 10 students or fewer that either:
    - Replaces a condemned or previously condemned and vacant structure located within or abutting an Opportunity Zone; or
    - Produces more than 50% of its units as affordable to households earning 60% or less of area median income.

# Developer Involvement

- School site dedications and reservations
- School impact tax payments

# Master Planning Perspectives

- Exploring school capacity over the longer-term
  - School site dedications and reservations
  - School system real estate inventory
  - Other publicly-owned real estate inventory
- Exploring school enrollment over the longer-term
  - Estimate the enrollment impacts of increase density resulting from the master plan
  - 10- and 15-year projections from MCPS at the cluster-wide level



# Various Planning Time Horizons

- MCPS Capital Planning Timelines
  - 6-year CIP
  - 10- to 15-year
- Development Application Review Timelines
  - Tested against 6-year utilization projection, regardless of construction timeframe
- Master Plan Creation and Implementation Timelines
  - 20 or more years

# For More Info...

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