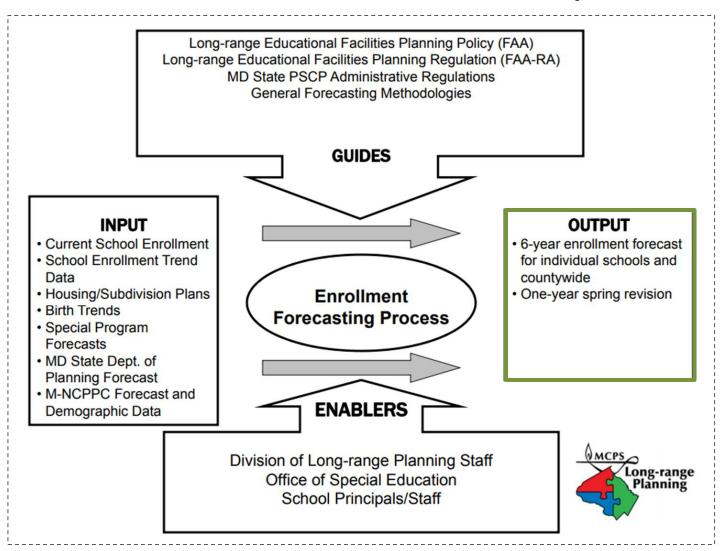
Overview of the MCPS* "CIP SuperTool"

Brian Krantz
MCCF Meeting Dec 9, 2019

* The CIP SuperTool is a community/individual effort, not produced by MCPS

MCPS Enrollment Forecast Process Map¹



MCPS DLRP Linkages Chart¹

Division of Long-range Planning Strategic Plan – January 17, 2014

CUSTOMER FOCUS

Staff effectively communicate and partner with MCPS units, with governmental agencies, and with other stakeholders.

Staff serves as a bridge between the community and architects as new facilities, and modifications to existing facilities, are designed.

Staff identifies and understands the needs of customers and stakeholders and provides products, resources and services to address those needs

LEADERSHIP

The mission of the Division of Long-range Planning is to inform decision makers and the community to address changes in enrollment and instructional programs through development of high quality data analysis, planning strategies, and long-range plans.

LEADERSHIP GOALS:

MISSION:

- * Division leadership provides a clear understanding of planning prioritie to internal and external stakeholders.
- * Staff provides leadership through facilitation of stakeholder proincluding boundary studies, roundtable discussions, developmeducational specifications, and community forums.

* Staff practice teamwork exercise leadership and a

PERFORMANCE RESULTS

Accurate one-year and six-year enrollment projections provide a basis for operating and capital budget decisions.

The CIP and Master Plan reflect the direction t by the superintendent of schools and Board Education (BOE), and are in accordance BOE policy and regulations, and state tlines.

> onal specifications for new and d/expanded facilities meet MCPS eeds and conform to state guidelines.

"Accurate one-year and six-year enrollment projections provide a basis for operating and capital budget decisions"

WORKFORCE FOCUS

Staff shares knowledge and tools on a regular basis, including information obtained through staff development opportunities and conferences.

Staff takes initiative to remain current with new developments that affect school system planning.

Staff utilizes outside experts to improve division performance.

Division work is distributed equitably, utilizing the strengths of staff members, in an environment characterized by teamwork and commitment.

The division recruits, hires, and retains the highest quality employees who work in a collaborative manner that fosters team spirit.

STRATEGIC PLANNING

The division develops six-year school system facility plans and the Capital Improvements Program (CIP) and Educational Facilities Master Plan.

Division planning processes respond to dynamic internal and external forces in development of innovative solutions to planning issues.

Division action plans focus on implementation of the strategic plan.

PROCESS MANAGEMENT/OPERATIONS FOCUS

Staff continuously improves planning processes and information to enable decision makers and the community to prepare for the future.

Staff works collaboratively with other MCPS offices and government agencies to develop and implement plans.

Staff solicits feedback from customers and stakeholders to identify process improvement opportunities.

Staff retreats are utilized to refine division operations.

The division web pages provide access to accurate and timely planning information.

Coordination with MCCPTA and the community is accomplished through forums to

MEASUREMENT, ANALYSIS, AND KNOWLEDGE MANAGEMENT

Staff research and develop data from a variety of sources including surveys, forecasts, and other types of data to fulfill the division mission.

Relevant data are made available to decision makers and the public, and analyses are prepared to support datadriven decision making and continuously improvement.

An integrated division information system is in place, and constantly evolving, to support the division's mission, goals, and strategies.

MCPS DLRP Linkages Chart¹

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Division of Long-range Planning Strategic Plan - January 17, 2014

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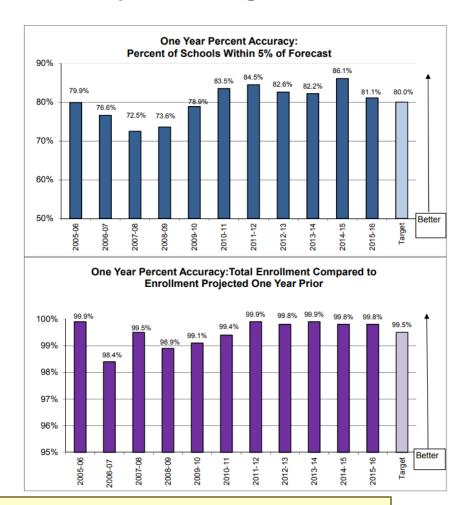
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Accuracy of Enrollment Forecasts: as Reported by MCPS Division of Capital Planning¹

- The only publicly-available self assessment are these two charts: neither have been updated in over four years
 - For each school year, the percentage of the 200+ MCPS schools where the 1-year forecast predicted enrollment within 5%
 - For each school year, the accuracy of total MCPS enrollment as predicted by the 1-year forecast
- Insufficiencies (besides being outdated)
 - No metric for the 6-year forecast, which is used for longer-term capital planning (and Subdivision Staging Policy)
 - No "close-look" at the individual school forecast performance
 - No cluster-level metrics
 - No information regarding the distribution of forecasting errors
 - Etc., etc., etc.



Forecasts Play a Prominent Role in Planning, but MCPS does not appear to Sufficiently Review Forecast Performance

Purpose

Why Develop the MCPS CIP SuperTool?

- Can't rely on MCPS to assess themselves: puts MCPS CIP Data in the hands of community advocates and activists
- Provides quantitative support for hearing testimony
- Could be used to help improve forecasting methodologies
- A template-based approach allows the same set of charts to be generated for any school, just by clicking a button

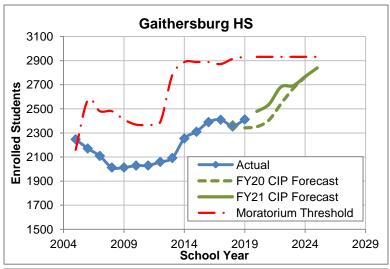
It's Hard to Believe, but it Appears that MCPS has No Means of Easily Assessing
Their Own Forecasts in a Meaningful Way

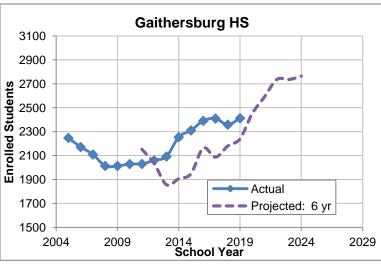
MCPS CIP SuperTool

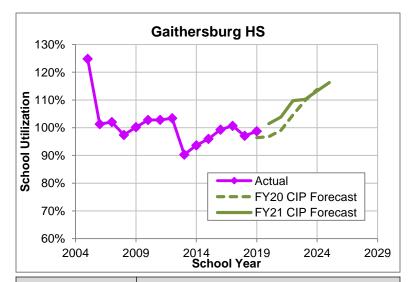
What is the CIP SuperTool?

- Dataset implemented in Microsoft Excel: common and readily available
- Contains data from all electronically available MCPS CIPs: FY2007-FY2021 (2005-2006 school year through present)
- CIP SuperTool dataset includes:
 - Actual, 1-yr, 2-yr-, 3-yr, 4-yr, 5-yr and 6-yr forecasts for <u>enrollment</u> and <u>capacity</u>:
 - Individual schools
 - MCPS System Grade Levels
- Contains a set of built-in template charts, and also calculates trends and forecasting accuracy for:
 - Individual schools
 - MCPS Grade Levels
 - Cluster-Levels
 - Cluster MS and ES Levels
- Recreates/updates the MCPS Performance Metrics
- Potential for anyone to use for their own analyses

Explicit Examples: CIP SuperTool Outputs



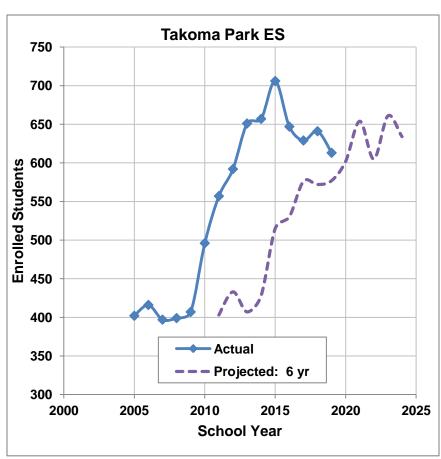


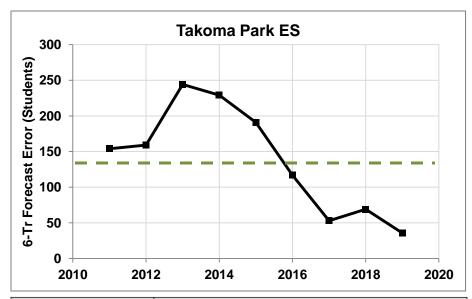


	For All Data: 2005+			
Forecast: Gaithersburg HS	# of Estimates		Average Error	
	Under Actual	Over Actual	(Students)	(%)
1-year	6	8	0.6	0.0%
2-year	8	5	14.4	0.7%
3-year	7	4	62.2	2.8%
4-year	9	2	122.8	5.6%
5-year	9	1	164.1	7.5%
6-year	8	1	194.2	8.9%

Interesting Examples: CIP SuperTool Outputs

Template Chart/Data Examples: 6-Year Forecast Performance for <u>Takoma Park ES</u>

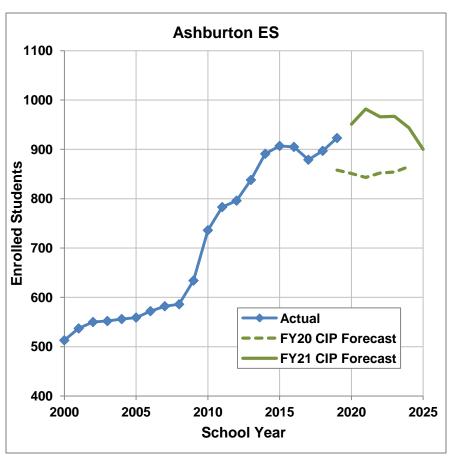


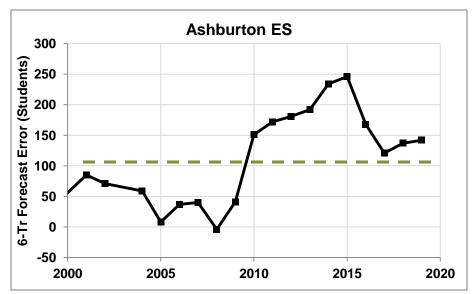


	For All Data: (2005+)			
Forecast: Takoma Park ES	# of Estimates		Average Error	
	Under Actual	Over Actual	(Students)	(%)
1-year	7	7	2.4	0.4%
2-year	10	3	21.9	4.0%
3-year	9	2	55.8	10.2%
4-year	10	1	81.3	14.8%
5-year	10	0	114.5	20.9%
6-year	9	0	139.1	25.4%

Interesting Examples: CIP SuperTool Outputs

Template Chart/Data Examples: Visualizing Current Forecast against Historical Enrollment for <u>Ashburton ES</u>

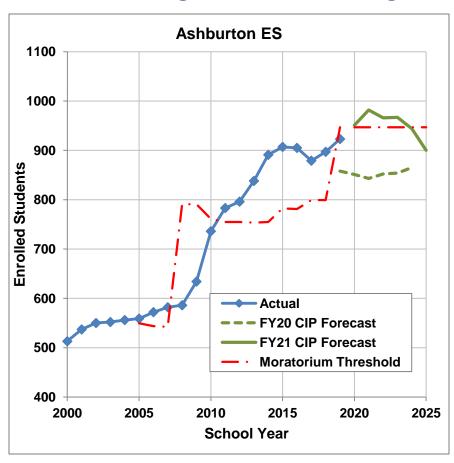


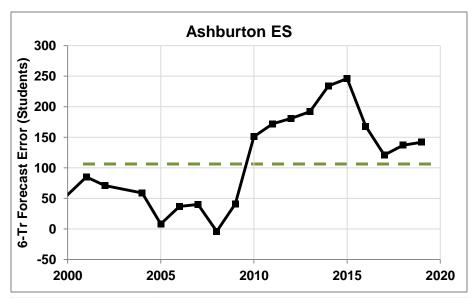


	For All Data: (1990+)			
Forecast: Ashburton ES	# of Estimates		Average Error	
	Under Actual	Over Actual	(Students)	(%)
1-year	8	17	-0.8	-0.1%
2-year	15	8	11.1	1.7%
3-year	15	6	35.0	5.5%
4-year	19	3	56.4	8.8%
5-year	20	2	77.8	12.2%
6-year	20	1	103.2	16.1%

Interesting Examples: CIP SuperTool Outputs

Template Chart/Data Examples: Visualizing Current Forecast against Historical Enrollment for <u>Ashburton ES</u>

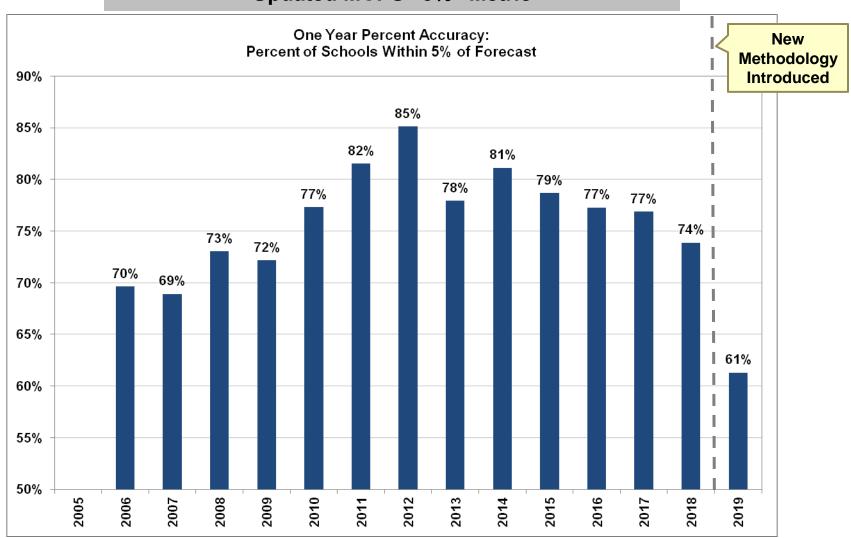




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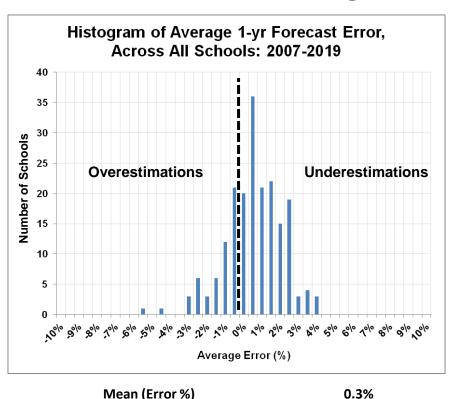
Explicit Examples: CIP SuperTool Outputs

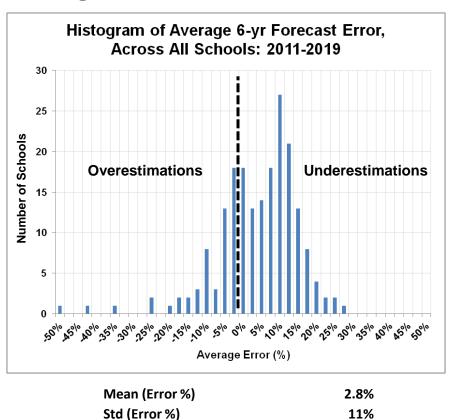




Implicit Examples: CIP SuperTool Outputs

Histograms of Forecasting Errors





Examining Distributions of Forecast Errors

Demonstrates Statistical Biases Towards Underestimating Enrollment

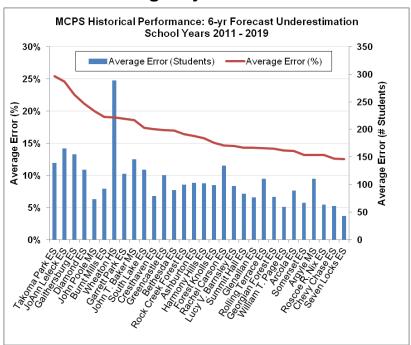
1.6%

Std (Error %)

Implicit Examples: CIP SuperTool Outputs

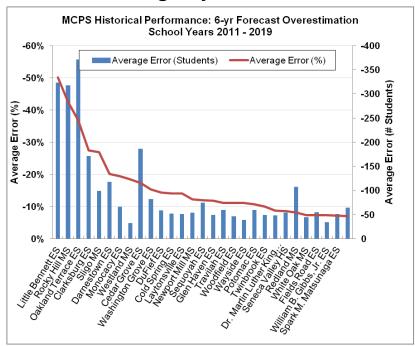
What Are the Worst-Forecasted Schools?

Worst Average 6-yr Underestimations



About 18 (of ~200) Schools with >15% Average Underestimation

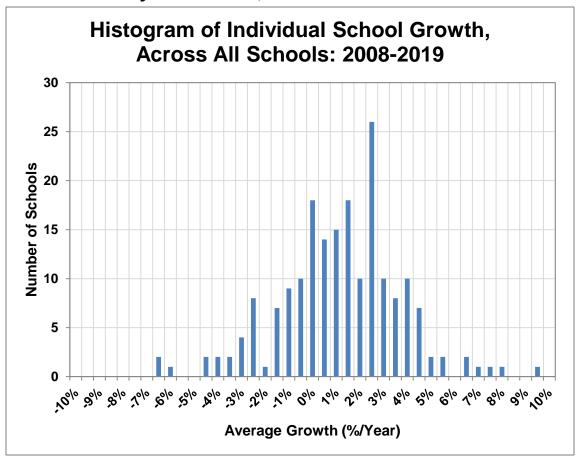
Worst Average 6-yr Overestimations



About 10 (of ~200) Schools with >15% Average Overestimation

School-Level Growth Analyses

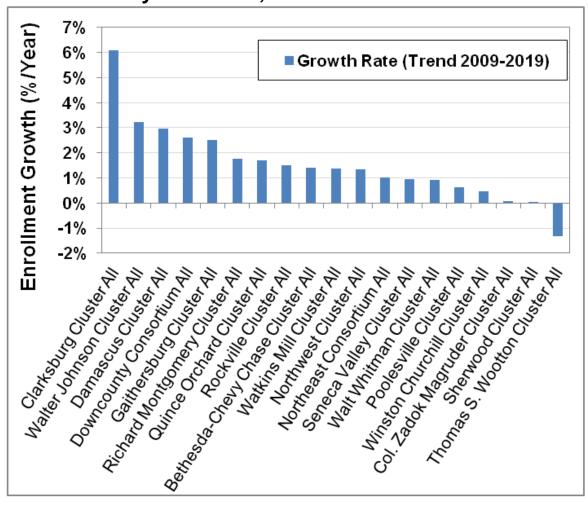
Yearly % Growth, Based on Linear Trend



Mean (%/Year) 1.3% Std Deviation (%/Year) 2.2%

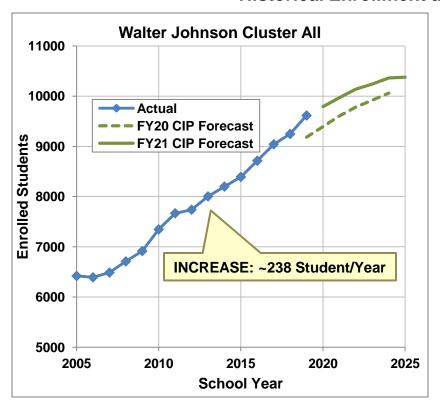
Cluster-Level Growth Analyses

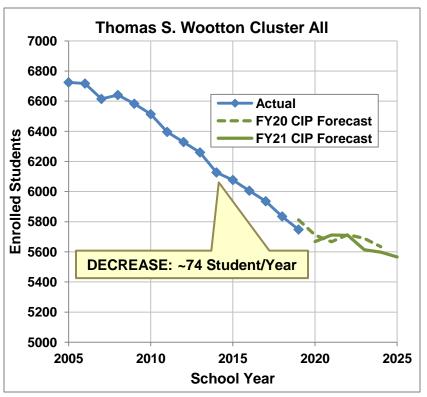
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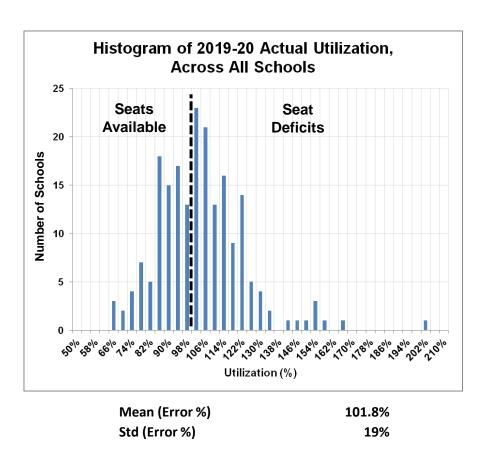
Growth Comparison: Walter Johnson versus Wootton Clusters

Historical Enrollment and FY20/21 Forecasts





Histograms of Actual Utilization



Real-Time Demo of CIP SuperTool

[Real-Time Demo of CIP SuperTool]

Circling Back: Purpose

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- Could be used to help improve forecasting methodologies
- A template-based approach allows the same set of charts to be generated for any school, just by clicking a button

- The CIP SuperTool can be a Powerful <u>Tool</u> (not an Analysis by Itself)
- Have Been Sharing SuperTool via Google Drive: will distribute Link to Latest Update
- Advocates need to Keep Pressure on MCPS to Fulfill their Responsibility to the Communities
- Current Forecasts are more Art than Science: Minimal Transparency, despite MCPS Claims

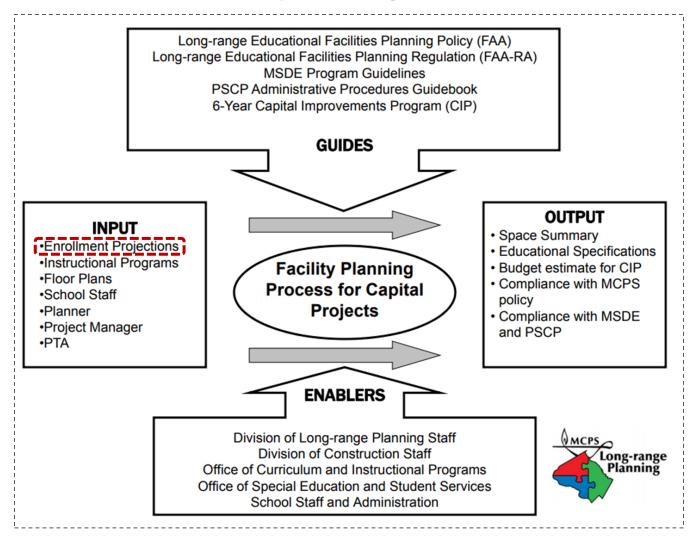
Questions?

Thank You for Your Time and Interest

Back-Up/Support Slides

Back-Up and Support Slides

MCPS Facility Planning Process Map¹



MCPS CIP/Master Plan Development Process Map¹

