County of Fairfax, Virginia

MEMORANDUM

DATE: September 11, 2013

TO: Infrastructure Financing Committee (IFC)

FROM: Susan W. Datta, Chief Financial Officer

SUBJECT: Responses to Committee Questions (Package 2)

Attached for your information are responses to questions presented at the August 7th Infrastructure Financing Committee (IFC) meeting. If you need additional information, please contact me.

The following responses are included in this package:

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4	Please provide a list of all schools, their age, when they were last renovated, and the cost of that renovation. Please include examples of the schools renovated in the last 6 years.	2
5	Please provide details regarding space allocation policies for particular kinds of instructional programs. For example, what size space is required for music, for art, for gifted and talented programs, classrooms for children with special needs, etc… compared to those for ordinary classrooms.	4
6	Please provide statistics and back up data for the chart on page 17 of the Schools CIP presentation.	10
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8	Analyze a program of conducting a "mini-renovation" at the 20-25 year mark that would update essential systems only, followed by a more complete renovation at the 40 year mark. Outline what such a program would look like, assess the impact on students, and analyze the cost impact on the CIP program.	20

Attachment

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Response to Questions from the Infrastructure Financing Committee
August 7, 2013

Question: Why is maintenance being paid for out of school general obligation bonds?

Response: There are multiple components contained within the Infrastructure Management portion of the capital program. The majority have a life cycle in excess of 25 years such as paving, HVAC and roofing. In addition to these items new requirements are met through the fund as well such as ADA implementation, the replacement of life safety systems (fire alarm/sound) and security systems. These costs have been carried within the capital program for more than 25 years (beginning with the 1986 Bond Referendum). The decision to do so was made because of the fact that many of these items had a life cycle which conformed to acceptable capital bond expenditures and exceeded the funding capability of the FCPS annual operating budget.

Question: Are there changes in code or other practices that could reduce the cost of renovating/building schools?

Response: There is little question that code changes have increased the scope and costs of construction projects significantly especially over the past 25 years – not just for schools but all manner of construction. Beyond the code changes for building, mechanical and electrical systems the most significant impact are for the implementation of ADA access and site/storm water. We are not proposing that we be held exempt from the code, but merely clarified that there are significant costs associated with the changes to the code. We anticipate that as the code evolves within the next few years in alignment with environmental realities the costs will increase further.

In addition to the code changes which drive the project scope there are certain community expectations which are incorporated into our projects. Most significantly the attempt to reduce the impact of school related traffic within the neighborhoods and community. When implemented this means major reconfiguration of the onsite parking areas to separate vehicular traffic (kiss & ride) from the bus loop. This additional work increases the amount of impervious surfaces and reduces green space.

Question: What is the impact of scheduling school renovations at 30, 35 or 40 years, rather than 25 years?

Response: For the purposes of this question we do have a substantive idea of the impact of renovating every 35 years, as that is our current state. When a facility reaches 25 years it is likely that many of the core systems (HVAC and the roof) will be near the end of their life cycle. In fact, absent an adequate roof and HVAC system, a building would not remain viable for much longer. Not only do we expect our primary systems to last for the 25 year cycle, but we anticipate that a majority of the building to remain in an acceptable, functional manner – such as the flooring, ceilings, fixtures, doors and windows.

Because our renovation cycle is significantly longer than 25 years we are compelled to replace many of these systems out of cycle in order to keep the buildings habitable and viable until a renovation actually occurs. As the renovation cycle elongates it makes it much more difficult to perform major maintenance of these core systems and full scale replacement becomes necessary.

Schools are not used like many buildings. When you contemplate the number of students (occupants) within the buildings and the amount of wear generated through this use, the types of material and methods utilized need to be what is known as commercial/industrial. This requires the use of material throughout the facility which can withstand constant and repetitive use. This is why many of our schools which are nearing 50 years old and have not been renovated continue to use the same doors and hardware, toilet fixtures and windows. At some point in the near future, absent a renovation we will need to begin replacing these items increasing the pressure upon the bond/operating fund.

Question: Please provide a list of all schools, their age, when they were last renovated, and the cost of that renovation. Please include examples of the schools renovated in the last 6 years.

Response: The following chart displays renovation projects which were conducted between 2002 and the present. Included in each chart is the year the school opened, the year the renovation was completed, the age at the conclusion of the renovation and the final cost.

Elementary School Renovations	Year Constructed	Year Renovated	Age When Renovated	Final Cost
				$406,587,983
Lemon Road	1955	2002	47	$8,060,000
Camelot	1969	2002	33	$10,226,000
Kent Gardens	1957	2002	45	$11,365,000
Fort Hunt	1969	2003	34	$9,125,000
Orange Hunt	1974	2003	29	$10,787,000
Hunters Woods	1969	2003	34	$11,955,000
Riverside	1968	2004	36	$8,224,983
Forest Edge	1971	2004	33	$11,855,000
Floris	1955	2004	49	$10,648,000
Laurel Ridge	1970	2003	33	$10,899,000
Greenbriar East	1968	2005	37	$10,367,000
Greenbriar West	1971	2005	34	$14,863,000
Groveton	1972	2005	33	$12,125,000
Hutchison	1975	2005	30	$15,518,000
Wolftrap	1968	2005	37	$10,440,000
Navy	1965	2005	40	$15,050,000

Franklin Sherman	1952	2009	57	$14,230,000
Woodburn	1952	2009	57	$14,950,000
Sleepy Hollow	1954	2010	56	$14,426,000
Freedom Hill	1969	2010	41	$15,024,000
Great Falls	1962	2010	48	$16,221,000
Vienna	1964	2010	46	$14,594,000
Graham Road	1961	2012	51	$16,126,000
Mount Eagle	1949	2010	61	$11,202,000
Beech Tree	1968	2012	44	$14,365,000
Stenwood	1963	2012	49	$13,300,000
Westlawn	1951	2012	61	$17,235,000
Franconia	1964	2012	48	$14,619,000
Oakton	1967	2012	45	$16,231,000
Lake Anne	1967	2012	45	$14,875,000
Canterbury Woods	1965	2014	49	$17,682,000

Middle School Renovations	Year Constructed	Year Renovated	Age When Renovated	Final Cost
				$177,669,000
Holmes	1966	2004	38	$18,100,000
Glasgow Replace	1963	2008	45	$43,940,000
Key	1971	2009	38	$33,697,000
Longfellow	1960	2012	52	$34,550,000
Sandburg	1963	2014	51	$47,382,000

High School Renovations	Year Constructed	Year Renovated	Age When Renovated	Final Cost
				$413,236,000
Hayfield SS	1968	2003	35	$57,880,000
Lake Braddock	1971	2007	36	$72,150,000
South Lakes	1978	2008	30	$62,630,000
Woodson	1962	2009	47	$76,000,000
Edison	1962	2012	50	$71,611,000
Marshall	1962	2014	52	$72,965,000

Question: Please provide details regarding space allocation policies for particular kinds of instructional programs. For example, what size space is required for music, for art, for gifted and talented programs, classrooms for children with special needs, etc… compared to those for ordinary classrooms.

Response: The type and quantity of specific rooms contained within each school merely supports the programs offered and capacity requirement of the facility. The size of these spaces is determined by assorted factors such as code requirements (square feet per occupant), number of occupants (ingress/egress) and the type of equipment and activities within the space.

Elementary Schools

The majority of elementary schools (119 of 139) within FCPS offer the same program of studies consisting of Kindergarten through 6th grade instruction while the other 20 offer Kindergarten through 5th grade instruction. Beyond the core instructional grade levels each elementary aged student is offered the same level of supplemental instruction consisting of: physical education, music, art and media center activities.

In addition to these identical offerings for each elementary student there are a number of schools which serve students beyond their boundary such as Advanced Academic Centers (AAP), Science/Arts Magnets and Language Immersion. There are also a number of elementary schools with locally based (students within their boundary) Advanced Academic or a specialized focus. The AAP centers do not require special program spaces, merely standard classrooms. The magnet schools (Hunter's Woods and Bailey's) do have specialized spaces to accommodate the program of studies.
The distribution of Special Education students is not consistent on a school by school level as an attempt is made to keep these students with their peer group and maintain appropriate class size ratios. Where possible, it is preferable to keep these children within their neighborhood school. Not only are all elementary aged children offered the same set of core and supplemental programs, but the same additional programs are offered at each school as well. Most namely, chorus, band and strings for students in grades 4 through 6. These programs are taught within the existing school resource and multi-purpose rooms as well as temporary classrooms throughout the county. There are many differences in the types of educational support space within FCPS elementary schools which is primarily dictated by the demographics of the student body. For example, schools which have high populations of free & reduced lunch require additional instructional support thus requiring spaces for the staff and the programs. In addition to the additional programs offered, these schools frequently have smaller class sizes which impacts the efficiency of the facility. The following chart displays the desired square footage of core and supplemental learning spaces in an FCPS Elementary School based upon the 2009 Educational Specifications:

General Education	SQ FT Per Room
Kindergarten Classroom	975
1st Grade Classroom	825
2nd Grade Classroom	825
3rd Grade Classroom	825
4th Grade Classroom	825
5th Grade Classroom	825
6th Grade Classroom	825

Art	SQ FT Per Room
Art Classroom	1200

Music	SQ FT Per Room
Music Room	950
Music Room (Stage)	750
Instrumental Music Room	450

Library (proper)	3000

Gym 58'x94'	5452

Middle Schools

Like our elementary schools, each FCPS middle school offers the same basic program of studies. The majority (23 of 26) offer instruction to students in 7th and 8th grade, while the remaining 3 offer instruction to grades 6 through 8.

All middle schools have the capability to instruct our students in four core areas (Math, English, Social Studies & Science). In addition to these four required areas of instruction, each student is required to participate in a physical education class as well.

One fundamental difference between elementary and middle school is the fact that our middle school program of studies is far more diverse and extensive than the elementary level. The elective offerings include: Technical Education, Family & Consumer Sciences, World Languages,

Drama, Band, Orchestra, Chorus, Guitar, Photography, Key Boarding to name a few. Each semester the students have the option of selecting two of these elective programs.

There are a number of middle schools which also house a significant quantity of students from outside their boundary to attend the AAP Center. Our special education students typically attend their community middle school for instruction.

The following chart displays the desired square footage of FCPS middle school spaces per the 2009 Educational Specifications:

7th/8th Grade Core	SQ FT Per Room
English Classrooms	700
Social Studies Classrooms	700
Math Classrooms	700
Science Labs	1,100

7th and 8th Grade - Core Support	SQ FT Per Room
Multipurpose Classroom	700
World Language Classroom	700
Drama Classroom	700
Business Information Tech Room	950

Physical Education	SQ FT Per Room
Gym (w/ 600 bleachers)	10,000
Auxiliary Gym	1,000

Art	SQ FT Per Room
Art Lab	1,300
Computer Graphics Room	1,000

Music	SQ FT Per Room
Band Room	1,800
Choral Room	1,200
Orchestra Room	1,000

Tech ED	SQ FT Per Room
Tech Lab #1	1,975
Tech Lab # 2	1,975

Family & Consumer Sciences	SQ FT Per Room
Food Lab/Demo Classroom	2,160
Fashion Lab	1,725

High Schools

Every FCPS high school has the ability to support the required instruction of all eligible students. These required or core subject areas are: Science, Math, English and Social Studies. Physical Education is required for students through the 10th grade. In addition to the required programs, a significant majority of FCPS students elect to take World Language classes in order to qualify for college admission. The majority of high school aged special education students will attend their community school.

The primary instructional difference between our high schools is due to the class offering – either Advanced Placement (AP) or International Baccalaureate (IB). Both of these designations are used by colleges regarding admission requirements.

Like our middle schools, each high school offers a vast assortment of elective (non-required) programs for the students. These include: band, orchestra, chorus, weightlifting, dance, guitar, technical education, family & consumer sciences, business, marketing, multiple levels of art, photography, computer graphics, AutoCAD, and drama.

There are also a number of high schools which contain vocational centers. Many times students from neighboring schools will spend their day at these centers depending upon the particular subject they in which they are receiving instruction. The variety of offerings at the various centers is very large. Typically the vocational center will offer culinary arts, auto shop, cosmetology to name a few.

The following chart displays the square footage of the core and supplemental instructional spaces within FCPS High Schools per the Educational Specifications:

Science	Served	SQ FT Per Room
Chem/Bio Labs	28	1400
Physics/Geo Labs	28	1300
Multipurpose Lab	28	1300

Math	Served	SQ FT Per Room
Classrooms	28	700
Computer Science Lab	28	825

English	Served	SQ FT Per Room
English Classrooms	24	700
Publications Center	24	1000

Social Studies	Served	SQ FT Per Room
Classrooms	28	700

World Language	Served	SQ FT Per Room
Classrooms	28	700

Physical Education	Served	SQ FT Per Room
Driver Ed. Classroom (divisible)	35	975
Health classrooms (divisible)	28	850
Gym	224	18900
Multi-purpose PE	28	2600
Gymnastics/Dance	28	2400
Weight Room	N/A	1600
Wrestling Room	56	3000

Art	Served	SQ FT Per Room
2D Lab	28	1650
3D Lab	28	1650
2D + 3D Storage/Prep	N/A	700
Photography Lab	N/A	850
Dark Room	N/A	500
Computer Graphics Lab	28	1350

Music	Served	SQ FT Per Room
Band Room	28	2000
Choral Room	28	1700
Orchestra	28	1200
Guitar/Music Classroom	28	900

Theater Arts	Served	SQ FT Per Room
Auditorium	N/A	7000
Stage	N/A	1500
Set Shop	N/A	1000
Black Box Theater	28	1000

Business	Served	SQ FT Per Room
Business/Computer Labs	28	1300
Lecture Classroom	28	1300

Marketing	Served	SQ FT Per Room
Marketing Lecture Classrooms	28	700
Marketing Computer Lab	14	400

Instructional -Tech ED	Served	SQ FT Per Room
Design/Technology Lab	28	2000
Electronics Lab	28	1300
Modeling Lab	28	1000
CADD/Drafting Lab	28	1300

Family & Consumer Sciences	Served	SQ FT Per Room
Food Lab/Demo Classroom	28	2160
Life Management Lab	28	1000

Question: Please provide statistics and back up data for the chart on page 17 of the Schools CIP presentation.

Response: The following attachments were used as the basis of determining the costs and students comparison. The source material is from School Planning & Management Magazine, February 2013 issue.

FOR THE LOCAL ADMINISTRATOR

A Closer Look at Regions

What your neighbors are doing.

NATIONAL FIGURES ARE ALWAYS INSTRUCTIVE, but from the point of view of the local school administrator or school board, it may be more important to know what your neighbors are doing. *School Planning & Management's* regional figures are designed to help you do that.

On the following pages, figures are given for new school activity for each of 12 regions of the United States. In each region, the median is shown for each school type in terms of cost per square foot, cost per student and space per student. Also shown in the median school capacity reported, the building size and the building cost.

The purpose of this section is to provide data that can help you understand not only what your own district needs, but also what others are doing and how much their projects cost. The national tables allow comparison with districts with similar aspirations. Thus, if districts in your region on average tend to provide minimal space per student, but your district aspires to a variety of programs that need space, you may want to look at the space per pupil provided in the high quarter of the nation's schools (Table 5).

But the regional tables allow you to measure yourself against your neighbors. With this information, you will have data necessary to make your own plans and, in many cases, to help the public understand what you are building, why you are doing it and what it is likely to cost. Remember, there is no right or wrong — these are guidelines that need to be applied to your own local needs.

REGION 1 MEDIANS NEW SCHOOLS *(CT, ME, MA, NH, RI, VT)*

	Elementary	Middle	High
$/sq. ft.	$306.34	$213.33	$303.03
$/student	$50,791	$42,667	$69,119
Sq. ft./student	165.4	189.7	223.2
Students	475	750	945
Size (sq. ft.)	84,054	150,000	211,772
Total cost ($000)	$24,183	$29,000	$59,222

The median elementary school in Region 1 spent $306.34 per square foot or $50791 for each of 475 students accommodated. Middle schools cost less, something of a surprise. High schools cost $59.2 million for 945 students.

REGION 2 MEDIANS NEW SCHOOLS *(NJ, NY, PA)*

	Elementary	Middle	High
$/sq. ft.	$245.38	$216.86	$244.64
$/student	$40,000	$37,896	$55,328
Sq. ft./student	161.9	178.3	216.7
Students	505	740	874
Size (sq. ft.)	86,000	133,500	202,500
Total cost ($000)	$18,230	$28,250	$53,950

The median elementary school in Region 2 spent $245.38 per student or $40,000 for each of the 505 students accommodated. The median middle school cost $28.3 million and housed 740 students. The median high school in the region cost $54 million.

REGION 3 MEDIANS NEW SCHOOLS *(DC, DE, MD, VA, WV)*

	Elementary	Middle	High
$/sq. ft.	$247.62	$177.27	$231.82
$/student	$47,588	$37,500	$49,485
Sq. ft./student	186.6	198.8	201.7
Students	430	692	1,149
Size (sq. ft.)	73,773	132,000	251,700
Total cost ($000)	$20,852	$26,585	$57,540

The median elementary school in Region 3 cost $247.62 per square foot or $47,588 for each of the 430 students accommodated. The median high school with 1,149 students was 252,000 square feet and cost more than $57 million.

REGION 4 MEDIANS NEW SCHOOLS *(KY, NC, SC, TN)*

	Elementary	Middle	High
$/sq. ft.	$200.20	$204.11	$189.00
$/student	$29,000	$37,976	$36,311
Sq. ft./student	162.5	168.1	191.3
Students	510	710	1,188
Size (sq. ft.)	80,000	115,000	217,000
Total cost ($000)	$15,000	$26,500	$36,600

The median elementary school in Region 4 cost $200 per square foot or $29,000 for each of 510 students. The median middle school houses 710 students in 115,000 square feet. The region's median new high school housed 1,188 students and cost $36.6 million.

REGION 5 MEDIANS NEW SCHOOLS *(AL, FL, GA, MS)*

	Elementary	Middle	High
$/sq. ft.	$166.67	$165.53	$163.68
$/student	$23,567	$32,297	$32,923
Sq. ft./student	139.9	186.0	193.2
Students	461	828	1,008
Size (sq. ft.)	65,500	120,257	235,000
Total cost ($000)	$12,000	$22,000	$38,518

The median elementary school in Region 5 cost $166.67 per square foot or $23,567 for each of the 461 students. The median high school cost $38.5 million and encompassed 235,000 square feet. Middle schools were half that size and housed 180 fewer students.

REGION 6 MEDIANS NEW SCHOOLS *(IN, OH, MI)*

	Elementary	Middle	High
$/sq. ft.	$202.31	$209.86	$189.00
$/student	$31,446	$36,177	$45,622
Sq. ft./student	156.5	183.3	229.5
Students	474	600	600
Size (sq. ft.)	70,598	117,000	173,748
Total cost ($000)	$14,452	$26,000	$28,673

The median elementary school in Region 6 cost $202.31 per square foot or $31,446 for each of the 474 students. The median middle and high schools house just 600 students, a surprise in this region of large schools and may be a reporting error.

REGION 7 MEDIANS NEW SCHOOLS *(IL, MN, WI)*

	Elementary	Middle	High
$/sq. ft.	$173.96	$222.73	$191.79
$/student	$30,076	$44,545	$64,000
Sq. ft./student	191.0	186.1	305.3
Students	439	360	402
Size (sq. ft.)	73,000	67,000	160,000
Total cost ($000)	$12,950	$10,350	$29,900

The median elementary school in Region 7 cost $173.96 per square foot or $30,076 for each of 439 students. The median high school cost under $30 million and houses only 400 students, but provides 305 square feet per student, indicating the initial enrollment will be increased.

REGION 8 MEDIANS NEW SCHOOLS *(IA, KS, MO, NE)*

	Elementary	Middle	High
$/sq. ft.	$196.83	$164.17	$209.81
$/student	$29,474	$28,710	$30,205
Sq. ft./student	157.2	186.3	141.9
Students	430	564	834
Size (sq. ft.)	68,000	110,000	141,000
Total cost ($000)	$13,454	$19,700	$25,000

The median elementary school in Region 8 cost $196.83 per square foot or $29,474 for each of the 430 students. The median high schools cost $25 million and provide 141,000 square feet. Middle schools provide 186 square feet per student and cost $19.7 million.

REGION 9 MEDIANS NEW SCHOOLS *(AR, LA, OK, TX)*

	Elementary	Middle	High
$/sq. ft.	$199.73	$201.58	$201.98
$/student	$33,028	$31,958	$40,556
Sq. ft./student	158.8	177.5	227.3
Students	457	505	900
Size (sq. ft.)	72,500	88,500	180,850
Total cost ($000)	$15,130	$20,850	$27,000

The median elementary school in Region 9 cost $199.73 per square foot or $33,028 each for 457 students. Elementary schools allocated 159 square feet per student. High schools provide 227 square feet. The high schools cost $27 million; middle schools $20.8 million.

REGION 10 MEDIANS NEW SCHOOLS *(CO, MT, ND, NM, SD, UT, WY)*

	Elementary	Middle	High
$/sq. ft.	$150.11	$208.17	$163.30
$/student	$24,576	$37,102	$54,766
Sq. ft./student	137.8	191.3	279.8
Students	297	575	863
Size (sq. ft)	50,000	109,522	209,091
Total cost ($000)	$8,250	$1,569	$34,979

The median elementary school in Region 10 cost $150.11 per square foot or $24,576 for the 297 students. The high schools cost almost $35 million apiece and provide a median 280 square feet per student at a cost of $54,766 apiece.

REGION 11 MEDIANS NEW SCHOOLS *(AZ, CA, HI, NV)*

	Elementary	Middle	High
$/sq. ft.	$209.30	$221.32	$319.42
$/student	$32,639	$20,756	$86,375
Sq. ft./student	142.9	129.3	276.3
Students	470	468	900
Size (sq. ft.)	70,000	84,500	120,000
Total cost ($000)	$12,250	$35,400	$46,000

The median elementary school in Region 11 cost $209.30 per square foot or $32,639 for each of 470 students. The schools reported this year are largely from districts outside the large metropolitan areas, which may skew the numbers down from normal.

REGION 12 MEDIANS NEW SCHOOLS *(AK, ID, OR, WA)*

	Elementary	Middle	High
$/sq. ft.	$216.19	$219.33	$239.26
$/student	$33,516	$35,141	$44,318
Sq. ft./student	154.3	182.0	172.1
Students	393	740	683
Size (sq. ft.)	66,000	130,000	140,000
Total cost ($000)	$11,718	$26,730	$39,000

The median elementary school in Region 12 cost $216.19 per square foot or $33,516 for each of the 393 students. The median high school cost $39 million at $239.26 per square foot. Middle schools provide 182 square feet per student and cost almost $27 million.

Question: For all Schools please provide capacity levels, including current enrollment numbers over or under capacity.

Response: The following displays the capacity state of our schools at the conclusion of the prior school year (2013/2014 actual enrollment will be available in early October):

Elementary School	Planning Program Capacity	Enrollment June 2013	Capacity Status +/-
ALDRIN ES	766	707	59
ANNANDALE TERRACE ES	711	732	-21
ARMSTRONG ES	544	508	36
BAILEYS ES	1,020	1,311	-291
BEECH TREE ES	449	396	53
BELLE VIEW ES	646	542	104
BELVEDERE ES	638	666	-28
BONNIE BRAE ES	817	733	84
BRADDOCK ES	788	752	36
BREN MAR PARK ES	470	486	-16
BROOKFIELD ES	811	849	-38
BUCKNELL ES	398	282	116
BULL RUN ES	897	874	23
BUSH HILL ES	574	498	76
CAMELOT ES	696	581	115
CAMERON ES	734	557	177
CANTERBURY WOODS ES	711	682	29
CARDINAL FOREST ES	649	597	52
CENTRE RIDGE ES	896	851	45
CENTREVILLE ES	1,084	963	121
CHERRY RUN ES	524	491	33
CHESTERBROOK ES	631	703	-72
CHURCHILL ROAD ES	852	847	5
CLEARVIEW ES	780	694	86
CLERMONT ES	350	476	-126
COATES ES	773	766	7
COLIN L. POWELL ES	1,201	1,148	53
COLUMBIA ES	469	464	5

COLVIN RUN ES	896	888	8
CRESTWOOD ES	775	614	161
CROSSFIELD ES	803	745	58
CUB RUN ES	697	677	20
CUNNINGHAM PARK ES	500	478	22
DANIELS RUN ES	696	736	-40
DEER PARK ES	783	677	106
DOGWOOD ES	778	809	-31
DRANESVILLE ES	796	692	104
EAGLE VIEW ES	903	932	-29
FAIRFAX VILLA ES	625	450	175
FAIRHILL ES	593	623	-30
FAIRVIEW ES	699	661	38
FLINT HILL ES	637	691	-54
FLORIS ES	810	713	97
FOREST EDGE ES	857	794	63
FORESTDALE ES	605	607	-2
FORESTVILLE ES	745	672	73
FORT BELVOIR ES	1,102	1,125	-23
FORT HUNT ES	714	606	108
FOX MILL ES	744	621	123
FRANCONIA ES	554	560	-6
FRANKLIN SHERMAN ES	428	419	9
FREEDOM HILL ES	618	639	-21
GARFIELD ES	363	364	-1
GLEN FOREST ES	1,026	1,008	18
GRAHAM ROAD ES	439	478	-39
GREAT FALLS ES	624	578	46
GREENBRIAR EAST ES	1,014	868	146
GREENBRIAR WEST ES	875	1,003	-128
GROVETON ES	805	765	40
GUNSTON ES	646	544	102
HALLEY ES	800	754	46
HAYCOCK ES	750	958	-208
HAYFIELD ES	684	658	26
HERNDON ES	884	862	22

HOLLIN MEADOWS ES	686	637	49
HUNT VALLEY ES	666	616	50
HUNTERS WOODS ES	926	1,118	-192
HUTCHISON ES	905	907	-2
HYBLA VALLEY ES	763	858	-95
ISLAND CREEK ES	828	819	9
KEENE MILL ES	690	676	14
KENT GARDENS ES	813	915	-102
KINGS GLEN ES	550	472	78
KINGS PARK ES	652	684	-32
LAKE ANNE ES	716	680	36
LANE ES	881	802	79
LAUREL HILL ES	924	907	17
LAUREL RIDGE ES	899	819	80
LEES CORNER ES	751	731	20
LEMON ROAD ES	552	335	217
LITTLE RUN ES	395	374	21
LONDON TOWNE ES	969	902	67
LORTON STATION ES	847	1,008	-161
LOUISE ARCHER ES	722	827	-105
LYNBROOK ES	715	599	116
MANTUA ES	1,025	964	61
MARSHALL ROAD ES	596	666	-70
MASON CREST ES	811	478	333
MCNAIR ES	860	973	-113
MOSBY WOODS ES	911	928	-17
MOUNT EAGLE ES	387	361	26
MOUNT VERNON WOODS ES	701	707	-6
NAVY ES	829	808	21
NEWINGTON FOREST ES	758	648	110
NORTH SPRINGFIELD ES	714	556	158
OAK HILL ES	841	869	-28
OAK VIEW ES	795	767	28
OAKTON ES	735	794	-59
OLDE CREEK ES	516	447	69
ORANGE HUNT ES	830	787	43

PARKLAWN ES	825	756	69
PINE SPRING ES	565	581	-16
POPLAR TREE ES	763	636	127
PROVIDENCE ES	857	948	-91
RAVENSWORTH ES	588	525	63
RIVERSIDE ES	832	727	105
ROLLING VALLEY ES	623	555	68
ROSE HILL ES	794	744	50
SANGSTER ES	870	904	-34
SARATOGA ES	885	762	123
SHREVEWOOD ES	624	649	-25
SILVERBROOK ES	764	756	8
SLEEPY HOLLOW ES	450	429	21
SPRING HILL ES	1,025	955	70
SPRINGFIELD ESTATES ES	759	738	21
STENWOOD ES	495	529	-34
STRATFORD LANDING ES	844	886	-42
SUNRISE VALLEY ES	694	621	73
TERRA CENTRE ES	590	555	35
TERRASET ES	590	487	103
TIMBER LANE ES	635	572	63
UNION MILL ES	959	796	163
VIENNA ES	409	394	15
VIRGINIA RUN ES	880	787	93
WAKEFIELD FOREST ES	504	489	15
WAPLES MILL ES	855	890	-35
WASHINGTON MILL ES	608	653	-45
WAYNEWOOD ES	776	728	48
WEST SPRINGFIELD ES	587	482	105
WESTBRIAR ES	447	552	-105
WESTGATE ES	400	601	-201
WESTLAWN ES	755	741	14
WEYANOKE ES	607	563	44
WHITE OAKS ES	851	810	41
WILLOW SPRINGS ES	950	963	-13
WOLFTRAP ES	576	567	9

WOODBURN ES	502	493	9
WOODLAWN ES	629	738	-109
WOODLEY HILLS ES	800	713	87

Middle School	Planning Program Capacity	Enrollment June 2013	Capacity Status +/-
CARSON MS	1,350	1,363	-13
COOPER MS	1,080	799	281
FRANKLIN MS	1,080	844	236
FROST MS	1,180	1,082	98
GLASGOW MS	1,665	1,456	209
HAYFIELD MS	1,269	866	403
HERNDON MS	1,128	956	172
HOLMES MS	1,176	839	337
HUGHES MS	1,114	957	157
IRVING MS	1,222	1,021	201
KEY MS	1,080	783	297
KILMER MS	1,116	1,192	-76
LAKE BRADDOCK MS	1,642	1,418	224
LANIER MS	1,307	1,248	59
LIBERTY MS	1,283	1,118	165
LONGFELLOW MS	1,347	1,277	70
LUTHER JACKSON MS	1,146	1,165	-19
POE MS	1,341	941	400
ROBINSON MS	1,316	1,227	89
ROCKY RUN MS	1,070	1,023	47
SANDBURG MS	1,359	1,279	80
SOUTH COUNTY MS	1,309	1,055	254
STONE MS	1,128	815	313
THOREAU MS	854	837	17
TWAIN MS	1,025	886	139
WHITMAN MS	1,250	967	283

High School	Planning Program Capacity	Enrollment June 2013	Capacity Status +/-
ANNANDALE HS	2,532	2350	182
CENTREVILLE HS	2,056	2378	-322
CHANTILLY HS	2,583	2633	-50
EDISON HS	1,974	1664	310
FAIRFAX HS	2,412	2620	-208
FALLS CHURCH HS	1,954	1673	281
HAYFIELD HS	2,247	1923	324
HERNDON HS	2,016	2230	-214
JEFFERSON TECH HS	1,730	1819	-89
LAKE BRADDOCK SEC	2,914	2563	351
LANGLEY HS	1,977	1938	39
LEE HS	2,102	1793	309
MADISON HS	2,105	1986	119
MARSHALL HS	1,511	1649	-138
MCLEAN HS	1,986	2070	-84
MOUNT VERNON HS	2,443	1870	573
OAKTON HS	2,078	2210	-132
ROBINSON SEC	2,564	2672	-108
SOUTH COUNTY HS	2,323	1999	324
SOUTH LAKES HS	2,125	2290	-165
STUART HS	1,941	1727	214
WEST POTOMAC HS	2,228	2219	9
WEST SPRINGFIELD HS	2,080	2246	-166
WESTFIELD HS	2,786	2744	42
WOODSON HS	2,327	2212	115

Question: Analyze a program of conducting a "mini-renovation" at the 20-25 year mark that would update essential systems only, followed by a more complete renovation at the 40 year mark. Outline what such a program would look like, assess the impact on students, and analyze the cost impact on the CIP program

Response:

FCPS has analyzed various options to change the scope of renovations as a means to lower costs and reduce the length of the renovation cycle.. We have considered solutions such as programmatic additions only, environmental or sustainable facility upgrades only or limited scope renovations targeted to specific educational programs. Although each of these alternative solutions are viable, each have negative consequences. Chiefly, that each school is unique and facility improvement priorities are not uniform among all schools. The most viable solution may be to move away from a 'one size fits all' solution and consider a program that allows specific solutions and priorities for each school. The means to implement this solution would be to allocate funding based on square footage and upon an amount that would allow all schools to be renovated on a 25 year cycle.

As mentioned previously, the current rate of capital funding (absent further decreases in construction costs) cannot achieve more than a 34 year cycle and is expected to grow to more than 40 years due to competing needs – primarily increased infrastructure costs and capacity requirements.

Impact on the Scope of Renovations

If we were to implement a funding cycle that represents some form of major capital work in each facility every 25 years, the projects would be drastically different than the full scope renovations performed today.

Despite the scope differences, certain aspects of our current renovations would be required at each school – primarily electrical and mechanical system upgrades or replacements. These system replacements are essential since they impact the health and welfare of our students and employees and lower potential energy and life cycle costs critical to meeting our sustainable objectives. It is also very likely that the building codes will have evolved to mandate these changes whenever a significant facility alteration occurs.

Major Building System Costs

Because FCPS is committed to replacing the majority of the electrical and mechanical systems within a school, it is important to understand the function and cost of the major systems components.

The **mechanical** system is comprised of four major elements: the ventilation systems, the plumbing system, the sprinkler system and the automatic temperature control system. The primary cost in the mechanical category is the ventilation system. Although our facilities are code compliant and safe, they were initially designed with cost being the primary objective. These systems were not always conducive to a quality learning environment due to their noise generation and lack of humidity control. In addition,

their life cycle costs were excessive from both a maintenance and energy consumption perspective. In 2003, we began to design the ventilation system to insure that the classrooms were quieter; the energy consumption was lower; and active dehumidification was included. The improved design required a greater proportion of the construction budget be spent on this category in particular.

The **electrical** system has multiple elements as well. The primary aspects of this system are: power, lighting and electronic systems. Typically, when a facility is renovated it will receive a new electrical system because the original is undersized. The new power distribution systems are designed to be more efficient and provide better real time feedback regarding energy consumption and status. The lighting systems are also more efficiently designed, using occupancy sensors, T-5 and T-8 lamps and ballasts, as well as unique engineering for specialized spaces. The largest change to the electrical systems is the growth in quantity and complexity of the electronic systems. These systems include: security, fire alarm, sound, CATV and computer networking. Because this technology evolves at a faster rate than more established systems, the costs and scope varies along with the evolution.

Another major construction cost category is the **site** work which involves all physical exterior improvements to the school such as: paving, landscaping, sidewalks, athletic fields, playgrounds, and traffic control and storm water management. Although these costs have increased somewhat over the past few years, we expect them to rise at a faster rate than some of the other categories. The primary area where we anticipate higher costs are traffic control and storm water management due to changes in the civil construction code and behavior of our students and parents who seem to increasingly rely on single vehicles to transport students and less on walking or busses..

The broadest cost category is the **building**. The major components of the building category are: floors, walls, the building structure, roof, doors, and windows – essentially everything not included in the prior categorical groups.

If we intend to renovate our schools every 25 years, and are committed to producing sustainable and healthy buildings, the physical building will be the area impacted most significantly by a change in the scope of renovations as the replacement of the mechanical/electrical systems are not optional – nor is it likely that the site work would be omitted either. This would mean that only essential building elements would be affected such as: flooring, paint, windows and doors. The remainder of the building would remain intact, with only a few minor alterations to accommodate the core system upgrades.

The unfortunate outcome would be a lack of parity amongst schools renovated under the reduced scope and those which had been renovated or constructed post 1992. The reduced scope facilities would continue to struggle or be incapable of supporting the standard program of studies offered within FCPS.