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LEXINGTON PUBLIC SCHOOLS TECHNOLOGY MASTER PLAN, LONG-TERM TECHNOLOGY BUDGET PLANNING

Revised October 15, 2009

The purpose of this document is to describe the anticipated technology requirements and systems for the classrooms throughout the District. This information will support the planning and budgeting activities within the District.

This document consists of the narrative and supporting appendices. The appendices include:

- budget projection for the district for the required technology and systems to accomplish the goals of the technology plan, projection is broken down by school;
- the cost of a typical classroom configuration;
- the cost estimate to provide wireless connectivity to supplement the existing networks;
- a summary of the classrooms and teaching spaces, by school

CCR Pyramid, Inc, ("CCR"), is an independent technology consulting and design firm that supports school districts and architects nationally and internationally. CCR is a professional services firm and is not aligned with any manufacturer and does not sell or endorse any products. In our practice, we observe that the educational technology trends in higher education are quickly flowed down to high schools and then in middle and elementary schools, as the technologies become more available and as the associated curriculum are expanded to the secondary and primary levels.

In our work with numerous Districts and schools, some major technology trends are becoming evident. The major shaping trends that we see include:

- Wireless networking is becoming the connectivity of choice;
- Large images and excellent audio;
- Access to technology, all the time, everywhere;
- Reduced emphasis on the brand and configuration of the computer and a growing focus on the reliability and availability of the computing devices.

With regard to the specific requirements of the Lexington public schools, these trends apply in the manner described below:

- Interactivity and collaboration, there is a continued recognition of the need to engage students in teams and groups as a part of the educational experience;

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- Portable Computing and Connectivity: The fundamental expectation for connectivity is growing to the point where faculty and students expect to be able to connect to any system at any location. Additionally, there are growing expectations and requirements for connectivity to the technology resources from remote locations. This connectivity supports the faculty access to curriculum and management systems as well as student access to their work and resources wherever they choose to work, individually or in teams;

- Excellent Audio/Visual Systems: Each teaching space needs to provide large image display, whether projected or in a screen format (LED, etc.). Each occupant in a teaching space needs to be able to easily see the large image. The continued growth in team work and collaboration requires that not only the faculty, but the students and groups of students are able to easily display their work for presentation and review by the other students. Each teaching space needs to be equipped with an excellent audio system to provide voice lift support for teachers or presenters as well as excellent replay of program audio. The integration of presentations, video and audio material into the classroom requires these support systems to ensure that it is successfully used;

- The development of smaller, more powerful and longer lasting computing and computer related equipment such as laptops, netbooks, touch devices, IPod touch, etc., Kindles and other similar devices are changing the way that information is collected, shared and stored. These devices also facilitate the recall and use of information at multiple locations as well as enhancing the collaborative ability of students and faculty, generally without geographic boundaries. There are emerging educational support systems such as portable tablets, voting systems, "clickers", etc. These systems provide an environment where faculty and students are able to interact with audio/visual equipment and the classroom activities from any location within the classroom. This movement toward geographically independent technology and interactivity further illustrates the requirement for large displays and good audio in the teaching spaces.

- Interactivity such as the ability to manipulate, highlight, annotate large image data as provided by the electronic whiteboards, is becoming a fundamental requirement of the teaching spaces. This technology can be achieved in many ways including physical electronic whiteboards, interactive tablet based instructional positions, portable wireless tablets, applications on tablet notebooks, etc. The important contribution of this technology to the technology strategic plan is to acknowledge that the interactivity will be a required functional element of each teaching space, regardless of its actual method of delivery.

  A technology master plan for Lexington must take into account that students and faculty need access to technology anytime and everywhere. This means that the following systems and functionalities are required in each teaching space:

  - A large image display;

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- Classroom voice and program audio system;

- Wireless connectivity;

- Interactivity, tablet, touch or other system based;

- Interactivity through voting and registration systems, whether a physically separate system with handheld or through the use of the portable computing device or cell phone;

- Ubiquitous computing environment in which each student has a portable computing device that is part of their daily educational activity and moves with them from class to class.

It is important to note that the master plan does not envision the use of all of these technologies, particularly the interactivity elements, in the Kindergarten classrooms.

End

LEXINGTON PS MASTER PLAN SUMMARY BUDGET 2009-09-30

School		Room Quantity	Technology Cost	Extension	Sub-Totals	Total
BOWMAN	Classrooms					
	Kindergarten	4	2,940.00	11,760.00		
	Other	23	5,100.00	117,300.00		
				0.00		
	Reuse 25% projectors	13	-555.00	-7,215.00		
	Reuse 70% whiteboards	1	-1,512.00	-1,512.00		
	Mount existing projectors	13	680.00	8,840.00		
					129,173.00	
BRIDGE						
	Kindergarten	4	2,940.00	11,760.00		
	Other	20	5,100.00	102,000.00		
				0.00		
	Reuse 25% projectors	13	-555.00	-7,215.00		
	Reuse 70% whiteboards	1	-1,512.00	-1,512.00		
	Mount existing projectors	13	680.00	8,840.00		
					113,873.00	
ESTABROOK						
	Kindergarten	4	2,940.00	11,760.00		
	Other	21	5,100.00	107,100.00		
				0.00		
	Reuse 25% projectors	13	-555.00	-7,215.00		
	Reuse 70% whiteboards	0	-1,512.00	0.00		
	Mount existing projectors	13	680.00	8,840.00		
					120,485.00	
FISKE						
	Kindergarten	3	2,940.00	8,820.00		
	Other	22	2,160.00	47,520.00		
				0.00		
	Reuse 25% projectors	0	-555.00	0.00		
	Reuse 70% whiteboards	0	-1,512.00	0.00		
	Mount existing whiteboards	22	480.00	10,560.00		
					66,900.00	

HARRINGTON						
	Kindergarten	3	2,940.00	8,820.00		
	Other	19	5,100.00	96,900.00		
				0.00		
	Reuse 25% projectors	25	-555.00	-13,875.00		
	Reuse 70% whiteboards	0	-1,512.00	0.00		
	Mount existing projectors	1	680.00	680.00		
					92,525.00	
HASTINGS						
	Kindergarten	3	2,940.00	8,820.00		
	Other	20	5,100.00	102,000.00		
				0.00		
	Reuse 25% projectors	16	-555.00	-8,880.00		
	Reuse 70% whiteboards	0	-1,512.00	0.00		
	Mount existing projectors	16	680.00	10,880.00		
					112,820.00	
DIAMOND MS						
	Kindergarten	0	2,940.00	0.00		
	Other	66	5,100.00	336,600.00		
				0.00		
	Reuse 25% projectors	20	-555.00	-11,100.00		
	Reuse 70% whiteboards	1	-1,512.00	-1,512.00		
	Mount existing projectors	18	680.00	12,240.00		
					336,228.00	
CLARKE MS						
	Kindergarten	0	2,940.00	0.00		
	Other	51	5,100.00	260,100.00		
				0.00		
	Reuse 25% projectors	25	-555.00	-13,875.00		
	Reuse 70% whiteboards	10	-1,512.00	-15,120.00		
	Mount existing projectors	5	680.00	3,400.00		
					234,505.00	

LHS						
	Kindergarten	0	2,940.00	0.00		
	Other	112	5,100.00	571,200.00		
				0.00		
	Reuse 25% projectors	80	-555.00	-44,400.00		
	Reuse 70% whiteboards	10	-1,512.00	-15,120.00		
	Mount existing projectors	60	680.00	40,800.00		
					552,480.00	
DISTRICT						
	Wireless networking				309,349.50	
Totals						2,068,338.50

Note1: the reuse number reflects the age and useful life expectancy of the existing equipment

Note 2: the installation number for the projectors reflects the anticipated cost to mount existing projectors

Note 3: $111,847.50 of the wireless networking equipment will be installed at the high school, the remainder
   will be distributed throughout the other schools.

Note4: Fiske School never received the standard electronic whiteboards (Smart, Promethean) but a substitute configuration.
   Cost for Fiske School would be to add these electronic whiteboards as well as provide kindergarten rooms with LCD display

Note 5: In each of elementary schools, rooms being equipped include all K-5 classrooms as well as 3 additional educational spaces

Lexington Public Schools
Typical Future Classroom Configuration
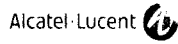Revised October 10, 2009

Classroom Technology Configuration (except for kindergarten classrooms)

System	Estimated cost	Comment
Large image, projection or display	2,200.00	
Interactivity functionality, electronic white board, tablets or other	2,160.00	
Audio system for speech and program audio	740.00	
Wireless network access		Cost is included under networking estimate

5,100.00

NOTE: The kindergarten rooms will need only a large image LCD display and suitable audio
    therefore the Kindergarten room budget is 2,940.00

NOTE: this estimate does not include computers, printers or similar devices

LCN networks

Voice Data Video

260 Libbey Parkway, Weymouth, MA 02189   P: 781.340.1400

Price quotation prepared for:
Lexington Public Schools

Alcatel·Lucent

Wireless Network Infrastructure Quote
District

Date: **28-Sep-09**
Buyer Reference: MDL
Prepared by: Michael D Lieb

All Pricing is in U.S. Dollars

Product	Description	List Price	Cat	Qty	Your Cost	Extension
Section 1: Hardware and Firmware Options						
	High School Wireless Equipment					
OAW-6000-PS4-US	Alcatel OmniAccess 6000 Chassis for PoE configurations. Includes one modular 4- Slot 19" Chassis, one fan tray, two 400 Watt Auto-sensing 110V/240V AC PSU, one accessory kit including US power cords. Chassis EEPROM conf...(See price list for more details)	$2,995.00	H	1	$2,246.25	$2,246.25
OAW-S3-0-2X10G	OmniAccess Supervisor Card III , 10x 1000Base-X (SFP), 2x 10GBase-X (XFP), (no AP license included). One OAW-6000 Chassis can accommodate up to four (4) Supervisor Card III.	$26,995.00	H	1	$20,246.25	$20,246.25
OAW-GBIC-T	OmniAccess GBIC Interface Adapter - T.	$500.00	H	4	$375.00	$1,500.00
OAW-AP-LAP64	Access Point License (64 Access Point License)	$4,320.00	H	3	$3,240.00	$9,720.00
OAW-AP-WIP64	Wireless Intrusion Protection Module License (64 AP Support)	$3,030.00	H	3	$2,272.50	$6,817.50
OAW-AP65	OmniAccess AP65 access point with Integral Antenna (2.4Ghz & 5Ghz Bands with Diversity). Supports 802.11a and 802.11b/g. Supports one 10/100 Base-T (RJ-45) Ethernet Interface (803.3af compliant and SoE capable). Incl...(See price list for more details)	$495.00	H	160	$371.25	$59,400.00
OAW-USR-PEF256	Policy Enforcement Firewall Module License (256 Users)	$2,000.00	H	1	$1,500.00	$1,500.00
OAW-AP125	OmniAccess AP125 wireless access point. OAW-AP125 IEEE 802.11n (draft 2.0) wireless access point with support for selectable 802.11'B/G/N' and 802.11'A/N' operation, 3x3 MIMO dual-band antenna, 2 x 10/100/1000Base-T (RJ...(See price list for more details)	$1,295.00	H	8	$971.25	$7,770.00
OAW-AP65-MNT	OmniAccess AP65 wall / ceiling / desktop mounting kit.	$35.00	H	160	$26.25	$4,200.00
OAW-AP120-MNT	OmniAccess AP12x series wireless access point wall / ceiling mounting kit. Includes: 1 x wall mounting cradle complete with security plate and anti-tamper screws, 1 x 15/16" to 9/16" recessed ceiling tile rail adapter a...(See price list for more details)	$35.00	H	8	$26.25	$210.00
	High School Wireless Integration					
LCN	On-Site System Integration	$1,600.00	A	7	$1,600.00	$11,200.00
	High School Wireless Network Switch					
OS6850-P24	OS6850-P24 PoE chassis w/SSL (DES, 3DES, RC2, RC4). L3 Gigabit Ethernet chassis in a 1U form factor with 20 RJ-45 PoE ports individually configurable to 10/100/1000 BaseT, 4 combo ports configurable to be 10/100/1000 Ba...(See price list for more details)	$4,995.00	G	30	$3,496.50	$104,895.00
SFP-GIG-LX	1000Base-LX Gigabit Ethernet optical transceiver (SFP MSA). Supports single mode fiber over 1310nm wavelength (nominal) with an LC connector. Typical reach of 10 Km on 9/125 μm SMF.	$995.00	G	8	$696.50	$5,572.00
SFP-GIG-SX	1000Base-SX Gigabit Ethernet optical transceiver (SFP MSA). Supports multimode fiber over 850nm wavelength (nominal) with an LC connector. Typical reach of 300m on 62.5/125 μm MMF or 550m on 50/125 μm MMF.	$345.00	G	22	$241.50	$5,313.00
	High School Wireless Infrastructure Cabling					
LCN	Cat 6 Wireless Cabling, testing	$353.00	C	160	$353.00	$56,480.00
					SECTION 1 SUBTOTAL:	**$297,070.00**
Section 2: Services and Installation Programs for Hardware listed above						
803023-00	One year License support. Includes 8-512 users Ap License, WIP License, 128-8182 users PEF License, VSM License, VPN License, xSEC License, 1-256 Indoor and Outdoor Mesh AP License, 7x24 phone support. SER-SOFT-OAW	$9,289.50	Z	1	$9,289.50	$9,289.50
802032-00	1 year 7x24 support PLUS for 1 OmniAccess OAW-6000 chassis (OAW-6000-PS2 or OAW-6000-PS4) equipped with 1 OAW-SC-1-128 and 1 or 2 line cards (OAW-LC-2G or OAW-LC-2G24F, or OAW-LC-24G24FP)	$2,990.00	Z	1	$2,990.00	$2,990.00
					SECTION 2 SUBTOTAL:	**$12,279.50**
Section 3: OmniVista Network Management System - Basic Product (Recommended on a per site basis)						
					SECTION 3 SUBTOTAL:	**$0.00**
					GRAND TOTAL:	**$309,349.50**

School	Grade	Classrooms	Classrooms	Projectors	Smart Boards		Other
BOWMAN	Kindergarten	4					
	1st Grade	4					1
	2nd Grade	4					
	3rd Grade	4					2
	4th Grade	4					Including library
	5th Grade	4	24	13	1		
BRIDGE	Kindergarten	4					
	1st Grade	3					
	2nd Grade	3					
	3rd Grade	3					
	4th Grade	4					Including library, art, SPED, OT & PALS
	5th Grade	4	21	13	1		
ESTABROOK	Kindergarten	4					
	1st Grade	4					
	2nd Grade	4					
	3rd Grade	3					
	4th Grade	3					Including library & possible new K class 10-11
	5th Grade	4	22	13	0		
FISKE	Kindergarten	3					
	1st Grade	4					
	2nd Grade	3					
	3rd Grade	4					
	4th Grade	4					has 25 Mimeos
	5th Grade	4	22	25	0		
HARRINGTON	Kindergarten	3					
	1st Grade	3					
	2nd Grade	3					
	3rd Grade	3					
	4th Grade	4					
	5th Grade	3	19	25	0		
HASTINGS	Kindergarten	3					
	1st Grade	3					
	2nd Grade	3					
	3rd Grade	4					
	4th Grade	4					Including Art, Music, Library & PE room
	5th Grade	3	20	16	0		
DIAMOND MS		66	66	20	1		Including Library
CLARKE MS		51	51	25	10		
LHS		112	112	80	10		Including Art, Music, Theatre, dance studio, resource rooms reading room, transition room, MST, ILP, LLP & Ell room.

| Totals | | | 357 | 230 | 23 | |

LPS Projectors Smart boards

Bowman	13 Projectors	0 installed					1 Smart boards
Bridge	13 Projectors	0 installed					1 Smart boards
Estabrook	13 Projectors	0 installed					0 Smart boards
Fiske	25 Projectors	All installed					25 Mimeos
Harrington	25 Projectors	24 installed					0 Smart boards
Hastings	16 Projectors	0 installed					0 Smart boards
Clarke Middle	25 Projectors	20 installed					10 Smart boards
Diamond Middle	20 Projectors	2 installed					1 Smart board
LHS	80 Projectors	20 installed					10 Smart boards