



# Lexington Public Schools

*Department of Technology*

## District Technology Plan: Roadmap for Deployment

Presented to the Superintendent and School Committee, this report provides an overview of how capital funding would impact district technology. This report highlights computer replacement and upgrade cycle through all schools and is part of the wider technology district plan (06-10).

Marianne McKenna  
Director of Technology

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Lexington has long had an active school technology program; built on the collaboration and continued commitment of its professional instructional and technical staff, administrators, teachers and staff, community and parent volunteers, and school committee members; backed by the town's long-standing support.

The challenge ahead is to leverage what we have together built in this district; renovate, retool, and re-energize technology. We aim to build **reliable, flexible and sustainable** framework to support top-notch instruction, efficient administration and improved communications throughout all our schools. All of the components of the framework, i.e., our network and computing infrastructure, our information systems, staffing and training, and instructional delivery tools need to be maintained; as each component is vital. A stable, balanced framework should allow us collaboratively to consider new technologies and solutions to merge them smoothly into our plans. The framework needs to equitably support all our schools, elementary, middle and high; students and staff, and provide opportunities at each level and building for innovation and initiative.

Though firmly fixed on our long term framework vision and open to new opportunities, for Lexington the road begins, and is grounded in the here and now; our district's resources, it's priorities and funding.

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## **Overview of Core Design**

Step one in our planning process was to do a complete review of current deployment of technology in the district; infrastructure, computer needs, network services, printer, peripherals and projection devices with an eye towards best practices and key needs. We developed and previously submitted plans to upgrade our network (wired and wireless), streamline our network services and administrative systems and realign our staffing. Going forward, a key district priority is the upgrade and overhaul of our student management system. This has started and will be ongoing in FY 08-FY09. We next turn to deployment of computers and classroom equipment.

Balancing administrative needs and instructional programs at all levels, we collaboratively identified a core set of technology goals and then a roll-out plan for how to reach those goals for each level given finite district resources. The plan attempts to focus on the critical core set of technology that based on current practice the district needs to continue to support effective instruction and school management. It allows for some future growth and builds in flexibility as building needs and initiatives may change over time. It does not include all the technology that we would like to see in the district. Nor will this plan happen

## Snapshot of Core Technology for Lexington High School ----- December 07

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### **Goals: (in collaboration with LHS technology committee findings)**

- Standard set of classroom tools (computer/projection/capture device) to support teaching
- Reliable student computing support both individual and project work
- Sustainable technology
- Core curriculum software installed/supported throughout
- Standard platform throughout building/Classroom and administrative staff
- Appropriate furniture/facilities
- Improve managed wireless network
- Shared/collaborative vision for technology
- **Improve access and ease of use for student demographic, tracking and assessment data.**

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### **Planned Core Instructional Components:**

All instructional classrooms/teaching spaces (125+) will have an upgraded desktop multimedia computer with internet access, standard software tools, and access to all required administrative systems (e.g. attendance, gradebook, grade entry etc.) . Teaching staff should have access to LCD projectors (either installed or mobile) and access to image capture devices as appropriate for instruction or need.

Each staff room will have a minimum of 3 upgraded computers for staff use.

All classroom and staff machines will have standard software tools including MS Office Apppleworks, standard web browsers, mail, and, web authoring software. With an ungraded to our Student Management System, we aim to provide universal access as appropriate for all staff to student data and tracking.

LCD Projectors will be available for instructional use throughout the high school; equitably distributed by building. Some spaces due to the nature of the instruction (e.g. science labs) or to the tight physical space may require permanently installed projectors. All labs and library media classroom have mounted projectors

The library as a research and media center will be equipped with at least 20 student computing stations for research; have a managed wireless network for use inside the facility; have two (2) carts of updated laptops (40) for library teaching and for shared use within main building.

Four (4) traditional wired computer labs with 30 stations (Two located in math building, One in Foreign Language, One in Humanities) with installed projection, network printers and scanner will be maintained. As the Science building does not have physical space for a traditional computer lab, at a minimum it will have 60 laptops and wireless network configured in 6 mobile carts to be used throughout the building. Math and Foreign Language Buildings will also have at least one upgraded wireless laptop cart for use in their buildings. Standard software kit will be installed on each as appropriate to its use.

Sony Digital Audio foreign language lab system including 30 computing stations, teacher console, presentation and audio management console and projection system will be maintained to support world language instruction..

LHS also maintains computer clusters with dedicated curriculum applications: Twelve (12) computers plus software and peripherals (electronic keyboards, synthesizer etc.) for Music Composing lab, twenty (20) in the Physics labs, Twelve (12) in MST contained classroom; and Ten (10) stations in Video/Multimedia Lab (plus teacher station).

Resource/Support rooms will have at least one upgraded OSX computer to a maximum of five to accommodate staff access to SEMSNET, as well as to student and staff access to Kurzweil and other assistive technology. Cluster support programs may require additional student computers (plan assumes no increase in number; though these may be reallocated from current location).

Fine Arts program maintains at least one high end production station with professional grade publication and design software.

Training facility will maintain minimum of 3 computing stations to support it's health and physical education curriculum.

LHS will maintain up to twenty (20) smartboard or other appropriate image capture devices for use in classrooms. Some will be permanently mounted (e.g., GEO rooms in Math building) while others due to cost, may need to be mobile to accommodate student needs. (Target maximum number of lhs projectors from all funding sources is approximately 50 total; the concern is to insure we have operating funds to maintain units).

All professional staff shall have access to appropriate computing necessary for their daily functions.

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**If we get the \$600,000 requested FY capital funds and this funding is sustained for the following three years, upgrading LHS to its core vision will**

take 3-5 years. Estimates are given for projection equipment in FY 08, we anticipate that additional purchases will be funded in subsequent years.

- FY - 08 - purchase 50 replacement computers/ replace/upgrade up to 20 projectors and/or purchase additional image capture devices
  - FY - 09 - estimated up to 100 computers (or other appropriate technology)
  - FY - 10 -estimated up to 175 computers (or other appropriate technology)
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**If we get the \$400,000 requested FY capital funds and this funding is sustained for the following three years**, upgrading LHS will take 5-7 years. Estimates are given for number of LCD projectors for FY 08, limited funds will be available in subsequent years for additional purchases.

FY - 08 - purchase 50 replacement computers/ up to 10 LCD mobile units  
FY - 09 - estimated up to 50 computers (or other appropriate technology)  
FY - 10 - estimated up to 50 computers (or other appropriate technology)

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#### **Technical Design Priorities:**

Although we have in the past two years, upgraded a number of older machines at LHS (including student labs and libraries), we will need to insure that we upgrade or replace a sufficient number of older classroom/staff machines at the high school within the next two years so that all will be able to efficiently access upgraded/replaced student information system. Also wish to maintain stable platform for all student computers. We need to look at alternative technologies for future instructional applications.

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overnight. It is a road map that can and will be continually refined as new technology becomes available and we rebuild our DISTRICT program.

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**The following pages provide an overview of technology at each level and a brief assessment of projected the roll out plan based on availability of town funding. These are estimates based on current prices, technology and current building configurations.**

**Contents Include:**

- **Snapshot of Technology for Lexington High School**
- **Snapshot of Technology for Middle Schools**
- **Snapshot of Technology for Older Elementary**
- **New Elementary Schools: Harrington & Fiske**
- **Computer Replacement: Potential Deployment by Funding**

## Snapshot of Core Technology for Middle Schools ----- December 2007

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### Goals:

- Standard set of classroom tools (computer/projection/capture device) to support teaching
- Reliable student computing to support both individual and project work
- Sustainable technology
- Core curriculum software installed/supported throughout
- Standard platform throughout building/Classroom and administrative staff
- Appropriate furniture/facilities
- Improve managed wireless network
- Shared/collaborative vision for technology
- Support new technologies in instruction/ match computing to application

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### Planned Core Instructional Components:

Clarke and Diamond have different computing requirements based on physical layout of each building and different instructional schedules. **This is general overview components common to both derived with input from both buildings. The projected numbers included in the plan have adjusted to accommodate each school's goals and core needs and to preserve equity between buildings.)**

All instructional classrooms/teaching spaces have upgraded desktop multimedia computer with internet access. These should include access to LCD projectors (either installed or mobile) and access to image capture devices as appropriate.

Library has minimum of ten (10) upgraded computers for student research via the library media program

Up to Four (4) "Computer on Wheel" Carts (laptops with projectors) for use by staff throughout the building and for presentations.

Minimum of Four (4) traditional wired updated computer labs (28 stations) to support curriculum with scanners and printers. Each lab has installed projector.

Resource rooms and SPED support rooms should have minimum of one upgraded teacher computer and 1-3 additional student computers as determined by program need and enrollment.

A minimum of three wireless mobile laptop carts to be shared within the building for project work (up to 60 computers).

A combination of installed and mobile LCD projectors and image of capture devices (e.g. Smartboard, ELMO, Mimeo) will be available for classroom use. Minimum of 25 units.

Network printers and peripherals available in labs, library, shared work spaces, staff room and as appropriate classrooms.

Core curriculum software tools installed on all student/lab and teaching computers. This will include:

- MS Office
- Appleworks
- Inspiration (and/or Inspire Data)
- Science: Wind, Moon, Cloud units
- United Streaming
- Timeliner
- Standard web browser
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Other instructional software as needed may include: Computer graphics/art design e.g. Photoshop, CAD, programming, multi-media tools.

Administrators, Sped/Resource and other instructional staff will have access to updated desktop or laptop computers. Multi-building staff to be handled by district allocation for equity.

Multimedia peripherals (e.g., video cameras, document cameras, digital cameras, microphone, etc .) will be available through the library program for shared use throughout the building.

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**If we get the \$600,000 requested FY capital funds and this funding is sustained for the following three years**, upgrading the middle schools to the core will take 3-4 years. Cost for LCD projectors/capture devices can vary widely; particularly if they are to be installed in existing schools. It's hard to estimate electrical requirements and costs of these installations. Funds are provided to reach our core goals.

FY 08 - purchase 30 new computers for each Clarke and Diamond (60 total)  
-up to 11 LCD projectors for Clarke; up to 15 LCD projectors for Diamond  
FY 09 - purchase 50 computers for each Clarke and Diamond (100 total)  
FY 10 – purchase 67 computers for each Clarke and Diamond (175 total)

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**If we get the \$400,000 requested FY capital funds and this funding is sustained for the following three years**, upgrading the middle schools will

take 5-7 years. Under this plan, more limited funds will be available for some projector upgrades.

FY 08 – purchase 30 new computers for each Clarke and Diamond (60 total)  
up to 11 LCD projectors for Clarke; up to 15 LCD projectors for Diamond

FY 09 – purchase 30 new computers for each Clarke and Diamond (60 total)

FY 10 - purchase 30 new computers for each Clarke and Diamond (60 total)

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**Technical Design Objectives:** We need to upgrade computers used by instructional staff to allow us to upgrade Student Information Package. In addition, the middle school library instructional program is significantly hampered by the older computers and need to be upgraded. These objectives were given priority in planning.

## Snapshot of Core Technology for Elementary Schools – December 2007

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### Goals:

- Standard set of classroom tools (computer/projection/capture device) to support teaching
  - Reliable student computing support both individual and project work
  - Sustainable technology
  - Core curriculum software installed/supported throughout
  - Standard platform throughout building/Classroom and administrative staff
  - Appropriate furniture/facilities
  - Upgraded internal networks
  - Shared/collaborative vision for technology
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### **Bowman, Bridge, Hastings, Estabrook Planned Core Instructional Components**

**Laptop for Instructional Classroom Teachers** for Multimedia Presentation (to be used in the classroom as primary computer).

Traditional wired **computing lab (28 stations)** network printing (B&W/Color)

**Mobile labs** for project work (60 stations) in carts with wireless capability

Up to eight (8) student research computers in library.

Projectors for shared use throughout instructional spaces. As funds allow, image capture devices (e.g. SmartBoard, Mimeo) in classrooms.

Core Curriculum Software (this list may need to be updated)

MS Office

Appleworks (?)

KidPix Deluxe (graphic/drawing/design)

TimeLiner

Type to Learn

Kidspiration/Inspiration (per grade level)

Neighborhood Map Machine

Math software (TBD)

Standard Apple Multimedia Software (iPhoto, iMovie, GarageBand etc.)

Administrators, SPED/Resource and Other instructional staff have appropriate computing. These will be allocated from district.

Additional student computers in Gr.3-5 classrooms to support daily work

Multimedia Peripherals (e.g. video cameras, document cameras, etc) available for shared use within the building.

Shared network printers for use throughout the building.

At a minimum, twelve (12) Alphasmarts (or other assistive technology) will be available for use in the building.

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**If we get the \$600,000 requested FY capital funds and this funding is sustained for the following three years**, upgrading Bowman, Bridge, Estabrook and Hastings to the core vision will take 3-5 years. The plan will include purchase of LCD projectors and some image capture devices.

FY 08 : we will complete:

- elementary internal network/cabinet upgrades
- elementary server upgrade/replaced
- purchase 30 computers
- purchase alphasmarts as needed

FY 09 - 75 computers per Elem4 school

FY 10- 45 computers per Elem4 school.

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**If we get the \$400,000 requested FY capital funds and this funding is sustained for the following three years**, upgrading Bowman, Bridge, Estabrook and Hastings to the core will take 5-7years.

FY 08 : we will complete at these schools:

- internal network/cabinet upgrades
- building server upgrade/replaced
- purchase 30 computers
- purchase alphasmarts as needed

FY 09 - 50 computers per Elem4 school

FY 10- 50 computers per Elem4 school.

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**Technical Design Priorities:**

We need to address the infrastructure of these four schools to insure network and electrical capacity. Unlike when we opened Fiske and Harrington with all

new computers, we will need to approach upgrading these schools' computers in phases and to the extent possible not disrupt ongoing programs. Although the longer term target is the same for each elementary building, implementation at each will take into account the buildings' own priorities and physical limitations.

## New Elementary Schools: Harrington & Fiske: A Look Ahead –Jan. 2008

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### **Harrington:**

Although Harrington has some of the best and stable technology in the district, there are still needs. Technology was funded in 2005 via the building funds and not by district operating nor technology capital.

**Computers:** Since Harrington was designed and opened; the district has shifted its plans for computer deployment. Key change here is that we are no longer going forward with the multiple computers per classroom model. We are shifting our core emphasis to provide classroom teachers with laptops and outfitting the classrooms with 1- 2 student computers. Recognizing that project learning and need for students to use computers in and around the classroom, we are planning to also provide wireless pods of laptops for sharing within each grade area or pod (this varies by building layout These additional units will be easily available when needed for a teacher to pull a group for an instructional unit. (This was not intended to function as a class lab set; but to provide portable workstations); leveraging out technology further.

There were several factors driving these changes – when we look at the funding projections for technology it was clear that the district would not easily be able to maintain that number of classroom computers district wide needed in the older model. We already see in the district that as the classroom computers start to age; classrooms would have computers of different “vintages” sometimes running different software. We have insufficient annual funds to be able to refresh all of the computers at one time. Over time the older classroom computers fall out of use, and require a lot of technical support. We want to shift our core package so that what we provide for teachers is consistent, stable and supportable. The core package is our priority right now. We also believe that new handheld and instructional devices may well alter what we need for computers down the road..

Harrington has close to the target number of computers that the district is planning (and can support) for elementary schools; but these are in different configuration from our new core design. (Although we still need to look at the enrollment impact resulting from the recent redistricting; and the needs of any new programs). **Our challenge will be to find a creative way to include laptops for Harrington classroom teachers and possible additional laptops for students within elementary building cap.**

Harrington computers are now close to three years old. Under district refresh plan, these would not be replaced for up to 2-3 years from now. (They are factored in the projection in FY10, although only should we get the \$600,000 capital funding) In the meantime we need to work together to determine what to do in case of loss or breakage. This will mean reallocating from within Harrington.

We will need to do wholesale OS system upgrades in the building (this may require us to purchase curriculum software upgrades as well). This is planned for Summer 08.

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### **Fiske –**

Just opened in 2007, Fiske technology funded by the building project included: laptops for classroom teachers, desktop computers for lab, library, staff and student use, managed wireless network throughout, installed projection system, mimeo capture devices, and pods of laptops computers strategically distributed throughout the building to facilitate project and class work. Fiske is one of the better equipped schools in our district. However, no plan should be static; no school considered “finished”.

Yet for this replacement projection, Fiske are not included in the next three year plan. Under current practice, replacement for Fiske would start no later than the FY11 (and possibly FY 10 ). There are many factors which could dramatically impact this – e.g., drop in computer pricing, new hand held technology that may displace the need for multiple desktop computers, etc. are just some examples. But we needed to make this estimate based on what is now known. We have reserved some funds for needed computers in order to accommodate future loss/ or irreparable damage, redesigned programs, or enrollment/staff changes at Fiske. We want to maintain to the extent possible the town’s investment in effective technology for Fiske.

The Fiske design (due to budget constraints) did not include all the instructional items that we would have like to see as part of our elementary school core. For instance, Mimeo’s were included in all classrooms on an evaluative basis. If after training and field testing during the school year, these don’t provide all the needed functionality for effective instruction, we reserved some funds to purchase Smartboards or other image capture devices for Fiske. Fiske also did not receive Alphasmarts and other assistive devices; nor all of the curriculum software initially planned. As funds permit in the district, Fiske will be included in these purchases.

Computer Replacement:  
Estimate Based on Current Pricing/Potential Deployment

<b>Based on \$600,000/Yr</b>	<b>FY 08</b>	<b>FY 09</b>	<b>FY 10</b>	<b>Total Replaced</b>
Elem4*	120	300	180	150/school
Middle Schools	60	100	175	167/school
High School	40	100	85	225 school
District/Other**	30	15	75	105 /district
	250	515	515	
<b>Based on \$400,000/Yr</b>	<b>FY 08</b>	<b>FY 09</b>	<b>FY 10</b>	<b>Total Replaced</b>
Elem4*	120	200	200	155/school
Middle Schools	60	60	60	90/school
High School	40	50	50	140 school
District/Other	30	5	5	40/district
	250	315	315	
*Elementary Schools included Estabrook, Bridge, Bowman, and Hastings				
**District includes CO,administrative computers and Harrington.				
Fiske is not included until FY ` 11 for global computer replacements; it is included for peripherals.				