



## **Wayland Public Schools Technology – 2020 Vision**

### **Capital Requests A Report to the School Committee**

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The following notes summarize the MESPA Audit conducted during the 2007-2008 school year. This documentation supports the need for Capital requests over the next 10 years to support a movement to a robust 21st century teaching and learning environment that is rich with technology integration for today's and tomorrow's digital learners.

## 1 MESPA Audit

From September 2007 through February 2008, the Massachusetts Elementary School Principals Association, Inc (MESPA) conducted a comprehensive Technology Audit of the Wayland Public Schools.

### 1.1 Vision

While the district technology plan set forth is closely aligned with best practices, it is not well understood by the school community. There is a need to facilitate the current goals to the school community, the teachers, students and parents and to begin work on our 2009-2012 vision. *We need:*

- Administrative commitment to reaching these goals
- Sufficient communication with the school and home communities
- Collaboration on developing a new vision for 2009-2012

### 1.2 Access

The report concluded that sufficient access to technology at school presents challenges at all levels. *Key highlights include:*

- Lack of consistent access to state of the art technology for students and teachers (computers, peripherals, network infrastructure)
- Inadequate funding to support a reasonable replacement cycle for computer and networking hardware
- District imposed network restrictions impede teacher use
- Schools lack high-speed Internet access

### 1.3 Technology Proficiency

The report identified that at every level, students have more technology skills than their teachers. *However:*

- There are K-12 pockets of excellence in teaching with technology
- Teachers are willing to engage in technology related professional development
- Differentiated professional development on technology integration for 21<sup>st</sup> century teaching and learning is paramount in moving WPS ahead

## 2 21<sup>st</sup> Century Teaching and Learning Resources

### 2.1 Massachusetts Department of Elementary and Secondary Education

The MA ESE provides a number of guidelines and resources for local technology Planning. These guidelines incorporate suggestions from the Educational Technology Advisory Council (ETAC), as well as from interested educators across the Commonwealth. Visit the following website for more information:

- <http://www.doe.mass.edu/edtech/planning.html>

### 2.2 Partnership for 21<sup>st</sup> Century Teaching and Learning (Route 21)

This is part of the Framework for 21<sup>st</sup> Century learning from the Partnership for 21<sup>st</sup> Century Skills. Our need to provide accessibility to technology is supported by this initiative. Massachusetts is one of the states committed toward helping young people build 21st century skills through this initiative. Visit the following website for more information:

- <http://www.21stcenturyskills.org/>

#### 2.2.1 Information Literacy

- Accessing information efficiently and effectively, evaluating information critically and competently and using information accurately and creatively for the issue or problem at hand
- Possessing a fundamental understanding of the ethical/legal issues surrounding the access and use of information

#### 2.2.2 Media Literacy

- Understanding how media messages are constructed, for what purposes and using which tools, characteristics and conventions.
- Examining how individuals interpret messages differently, how values and points of view are included or excluded and how media can influence beliefs and behaviors.  
Possessing a fundamental understanding of the ethical/legal issues surrounding the access and use of information

#### 2.2.3 ICT (Information, Communications & Technology) Literacy

- Using digital technology, communication tools and/or networks appropriately to access, manage, integrate, evaluate, and create information in order to function in a knowledge economy
- Using technology as a tool to research, organize, evaluate and communicate information, and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information

### 2.3 Governor Patrick's Readiness Project

Governor Patrick's Readiness Project is committed to preparing our students for 21<sup>st</sup> century success. His goals support our needs to "Unleash Innovation" to spur education reform. Technology integration and access to develop these skills in today's learner is paramount. Visit the following websites for additional information:

- <http://www.mass.gov/>
- <http://www.mass.gov/Agov3/docs/Readiness%20Final%20Report.pdf>

### 3 Technology Task Force – Accessibility of Technology

The Technology Task Force met in 2008 and presented a plan for addressing the issues set forth in the MESPA Technology Audit. Most of this report will focus on the work that was presented by the Accessibility of Technology Committee. This work highlights the changes that need to be made to our networking and computer hardware infrastructure. Their recommendation identify the needs set forth in this ten year capital planning requests.

The Accessibility of Technology subcommittee met twice in addition to the initial overall meeting and leveraged the Technology Audit in coming to the conclusions and initial recommendations defined in [Appendix A](#).

The following information came from a report by the Technology Task Forces and is based on guided benchmarks set forth by the Massachusetts Department of Elementary and Secondary Education (MA ESE) and developed by the State's Educational Technology Advisory Council (ETAC). This information supports the needs requested in the capital funding requests for technology. Massachusetts benchmarks are based on the International Society for Technology Education (ISTE) National Educational Technology Standards (NETS). ISTE's NETS have served as a roadmap since 1998 for improved teaching and learning by educators. ISTE standards for students, teachers, and administrators help to measure proficiency and set inspirational goals for the knowledge, skills, and attitudes needed to succeed in today's Digital Age.

#### 3.1 Hardware Access

**MA ESE:** The district has an average ratio of fewer than five students per high-capacity, Internet-connected computer. The ten year goal is to have a one-to-one, high-capacity, Internet-connected computer ratio first for teachers, then high school students, middle school students and finally elementary school students.

**Vision / Goal:** Currently 59% of the District's computers are classified as "Type A". A five year replacement cycle is needed and should include the role out of a teacher and student 1:1 computer initiative.

**MA ESE:** The district provides students with access to portable and/or handheld electronic devices appropriate to their grade level.

**Vision:** As needs grow, iPods and "clicker" devices should be acquired by schools to support learning in and out of the classroom. Other hand-held devices should be integrated into instruction, included data probes for science instruction, palm pilots and/or additional hand-held devices for research and 21<sup>st</sup> century communication and collaboration skills.

**MA ESE:** The district maximizes access to the general education curriculum for all students, including students with disabilities, using technology in classrooms with universal design principles and assistive technology devices.

**Vision:** Both the MS and HS need additional copies of Kurzweil to increase accessibility. The elementary schools should be introduced to the benefits of this program. Addition hardware and software resources need to be assessed and implemented to support differentiated instruction to meet the needs of special education students and all students.

**MA ESE:** The district has procurement policies for information and instructional technologies that ensure usability, equivalent access, and interoperability.

**Vision:** We need to provide more structure to this process and more documentation to ensure purchases are in line with District's goals.

**MA ESE:** The district provides classroom access to devices such as digital projectors and electronic whiteboards.

**Vision:** Goal of having at least one projector in every classroom. Begin with HS, then MS, then Elementary. This enables the use of whiteboards and/or document cameras as needs warrant and funding allows.

**MA ESE:** The district has established a computer replacement cycle of five years or less.

45.2% are five years or older

**Vision:** A five year cycle should be adopted.

## 3.2 Internet Access

**MA ESE:** The district provides connectivity to the Internet in all classrooms in all schools including wireless connectivity, if possible.

Each school has Internet connectivity in the classrooms. All schools have wireless connectivity.

**MA ESE:** The district provides bandwidth of at least 10/100/1 Gb to each classroom. At peak, the bandwidth at each computer is at least 100 kbps. The network card for each computer is at least 10/100/1 Gb.

**Vision:** Perform a comprehensive evaluation of network and servers to identify performance issues. Determine how to redesign the network to support school goals and possibly town functions. Work with selectmen to contact local carriers to negotiate support in creating a high capacity town-wide WAN.

## 3.3 Networking

**MA ESE:** The district provides a minimum 100 Mb Cat 5 switched network and/or 802.11b/g/n wireless network.

**Vision:** Due to the HS's campus setup, the wireless network needs to be upgraded.

**MA ESE:** The district provides access to servers for secure file sharing, backups, scheduling, email, and web publishing, either internally or through contracted services.

**Summary/Goal** Each school has a file server for both instructional and administrative machines. Each type is backed up at least once/week. The district provides webmail and a web server for publishing, as well as paying for teacher website subscriptions.

**Vision:** Upgrade backup system and look at offsite contracted services (esp. when bandwidth improves). Provide ubiquitous and secure access to files from any Internet connected device. Explore email and internet based storage for enhanced email, storage, calendaring, and collaborative capabilities.

## 4 Cost

### 4.1 Current Inventory

School	Instructional Environments	Enrollment	Projectors (Whiteboards)	Computers	Computers >5 Years
High School	44	900	15 (9)	505	177
Middle School	47	600	27 (5)	313	176
Claypit Hill	31	600	16 (1)	258	110
Happy Hollow	25	400	14 (4)	210	92
Loker	14	200	3 (2)	186	86
	<b>161</b>	<b>2700</b>	<b>75 (21)</b>	<b>1472</b>	<b>641</b>
Admin				40	15

### 4.2 Total Costs

COST					
Cost Schedule	5 Year Replacement	21 <sup>st</sup> Century Classroom	1:1	Networking	Total
Year 1 - 2010	300,000	10,000	50,000	390,000	750,000
Year 2 - 2011	300,000	50,000	200,000	200,000	750,000
Year 3 - 2012	200,000	100,000	55,000	100,000	455,000
Year 4 - 2013	200,000	100,000	55,000	100,000	455,000
Year 5 - 2014	100,000	100,000	55,000	100,000	355,000
Year 6 - 2015	100,000	100,000	110,000	100,000	410,000
Year 7 - 2016	100,000	100,000	110,000	100,000	410,000
Year 8 - 2017	100,000	100,000	110,000	100,000	410,000
Year 9 - 2018	100,000	100,000	110,000	100,000	410,000
Year 10 - 2019	100,000	100,000	110,000	100,000	410,000
<b>TOTAL</b>					<b>5,890,000</b>

Year 1 – Teacher 1:1

Year 2 – Complete Teacher 1:1

Year 3 – Grade 9

Year 4 – Grades 9 & 10

Year 5 – Grades 9, 10, & 11

Year 6 – Grades 9, 10, 11 & 12 (Begin Teacher Replacement Cycle)

Multiple Students

## 5 Summary

The following list identifies the key goals of the 10 year capital plan:

- Upgrade to an enterprise class network infrastructure ( 50% of hardware costs/building)
- Begin a 1:1 teacher laptop initiative
- Provide quality professional development – (30% of hardware budget costs)
- Implement a 5 Year Replacement Cycle – for all computer hardware
- Continue with a 21<sup>st</sup> Century Classroom Initiative (Interactive Instruction)
- Begin a 1:1 Student Initiative (Curriculum Driven)

### 5.1 Five Year Replacement Costs

We have an immediate need to replace 641 outdated computers in our classrooms and our computer labs. Every year, 200 additional computers become out-dated. (Greater than 5 years old.) As we move forward with the 1:1 computing and maintenance of a 5 year replacement plan and with decreased costs in technology, this amount will go down. We will also explore a voluntary purchase options to reduce the cost and expand on the use of 1:1 computing more prominently in our schools.

### 5.2 21<sup>st</sup> Century Classroom

This cost is to continue the implementation of a robust 21<sup>st</sup> century teaching environment that includes projectors, document cameras and interactive white boards. This amount funds the implementation of approximately five classrooms per school per year.

### 5.3 1:1 Computing

We will begin with a two year role out of teacher laptops and high quality professional development. This will be followed by a role out of student laptops for 21<sup>st</sup> century project-based teaching and learning. This amount funds approximately one full class with 1:1 computers. (For example, we would implement 1:1 with the ninth graders in 2012.) This option is drafted with a shared purchase of computers and the assumption that the cost of a student computer in 2012 will be approximately \$500.

### 5.4 Networking

We are currently updating the High School networking infrastructure and laying the foundation for all schools. In year one, we will complete upgrades at the Middle School and begin upgrades at the Elementary Schools. In year two we will complete elementary networking upgrades. Funding beyond year two will be used to maintain, upgrade and expand all networking features to maintain a state-of-the art infrastructure.

## 5.5

### Appendix A: Accessibility of Technology

#### Technology Task Force Subcommittee Findings – Summer 2008

The Accessibility of Technology subcommittee met twice in addition to the initial overall meeting, and leveraged the Technology Audit in coming to the below conclusions and initial recommendations. The bullets do not directly align with the Local Technology Plan Guidelines, but they are issues that directly affect access to technology in Wayland Public Schools.

- Technology Policy - Selection, Use and Implementation

The group recommends the establishment of a Technology Oversight Committee (made up of 1-2 teachers, an administrator, a student, a technology group representative and 1-2 parents) that would review ongoing policy, provide guidance and facilitate the process of procuring and implementing technology to support the curriculum and administrative functions.

Technology Oversight Committee - Mission Statement: to oversee the process of evaluating, enabling and facilitating the academic and administrative use of technology system-wide in a secure fashion.

**Background:** There are currently policies controlling the use of technology that appear to affect the accessibility of technology in favor of security. Most of the policies appear to be set of necessity by the technology group in the absence of administratively developed policies. A broader group representing the user community that includes technology staff representation should develop policies that support a better balance.

- Network Performance – LAN, WAN & Internet Reliability

The goal here is to establish a comprehensive plan and strategic vision to optimize network performance, insure reliability and improve operating efficiencies. The group recommends a more comprehensive evaluation of the network and servers to identify performance issues throughout the system including individual schools and the district/town. A subgroup of the Technology Oversight Group would be recommended to focus on this long term initiative.

The goal would be to determine how to redesign the network and system to support the overall technology goals of the school system and possibly town functions. This may include looking at centralizing management of the schools and town to maximize

efficiency and/or looking at ASP or hosting options for various services such as backup, server support, and specific application needs.

As part of this process it is recommended that the group work with the selectmen to contact local carriers to negotiate support in creating a possible high capacity town-wide WAN.

**Background:** Due to multiple factors such as funding, staffing, and policy, the network has grown beyond its originally intended design creating a difficult to support environment. The current bandwidth both internal to the local WAN and to the Internet has become insufficient. A centralized or combination of centralized and hosted services would likely improve service and reliability. Increasingly, educational services and curriculum are web-based and the schools need additional bandwidth to be able to perform at an acceptable level.

- Reliability - Network, Systems & Service

The recommendation is to develop a small subgroup that would meet regularly to understand what issues are affecting technology reliability so that responses can be properly prioritized. Possibly this would be a teacher & technology staff member at each location that reports issues in a tracking system that is reviewed weekly by the subgroup (possibly made up of a teacher, technology staff member & administrative representative).

If students or teachers perceive the systems as being unreliable, innovative use of technology will not flourish. Therefore, maintaining reliability is a key part of the plan.

**Background:** The group determined that there are certain issues that are affecting the stability and reliability of the networked systems. These may or may not be tied to insufficient network bandwidth, but the recommendation is to develop a system that tracks these issues and allows staff and teachers to prioritize and focus the department's support team to best handle these issues.

- Ease of Use – Teachers, Students, Administration, Parents & Support Staff

The network configuration, policies, system design and computer setup should allow ease of use primarily for teachers and students, and ideally for administration, parents and the technology support staff. The goal is to promote a more open and reliable computing environment, to foster creative and effective teaching/learning as well as a tighter and natural integration of technology in the curriculum.

1. The first recommendation is to assign non-managed or minimally managed laptops to teachers. This will allow them to use the technology they find most appropriately supports their efforts and to have creativity with regards to integrating technology into the curriculum.

2. The second recommendation would come in the form of improved email communication with parents via centrally generated listservs (electronic mail distribution lists). The plan would be to have listservs set up centrally for teachers by classroom and group, allowing parents to subscribe and unsubscribe directly. This would create a uniform and reliable way to facilitate communications.
3. The third recommendation is to develop a standard desktop by grade and/or status (teacher, 1<sup>st</sup> grade, staff, etc.) that simplifies options available and creates a more uniform feel to the technology experience.
4. Fourth, the group recommends taking a look at distributed control & responsibilities to support students, administration and teachers on-site. Part of this should fall under the policies heading, but enabling the local technology staff and then possibly implementing proactive network management tools for the centralized staff could greatly enhance the user experience.
5. Finally, ease of use assumes access, that there is enough hardware and software in the schools for teachers and students to use on a regular basis including computers, space for equipment, interactive whiteboards and projectors.

**Background:** Ease of use includes a certain comfort level with the technology that invites people to use it and to begin to explore. Enabling more control and support at the local level is one way this can happen. Other ways are to centralize processes that are universal so that more technical folks can handle them. A uniform look and feel will also provide a level of comfort.