FY11 Technology Capital Request

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Wayland's educational technology objective is to integrate with other aspects of curriculum to improve educational outcomes in a cost effective manner.

This document summarizes FY10 educational technology capital spending and the corresponding request for FY11. These goals and this vision supports those of the Massachusetts Department of Elementary and Secondary Education (MA DESE), the Partnership for 21st Century Teaching and Learning (P21/Route 21), and the goals set forth in Governor Patrick's Commonwealth Readiness Project designed to deliver a new 21st century promise of high–quality public education. Most importantly, this proposal reflects the work and vision of Wayland's Technology Task Force and Wayland School Technology Committees.

Vision: The Wayland Public Schools are committed to the effective integration and meaningful use of instructional and information technologies to support, enrich, and extend student learning throughout the curriculum. Through integrated learning experiences, students will develop the technology literacy needed to acquire and manage knowledge, to succeed in school, and to thrive in an ever-changing, globally competitive world. In the Wayland Public Schools, all members of our school community will use technology to excel as learners and to develop as leaders. Technology is a means for learning, not an end product of learning. Thus, technology will play a vital role in the process of teaching and learning that incorporates contextual learning, critical thinking, creativity, problem solving, and collaboration

To achieve this vision, the Wayland Public Schools are committed to providing access to:

- an enterprise class infrastructure (network, hardware, and software) that maximizes learning opportunities and provides connectivity to the global community;
- district-wide "one-to-one" computer access for all educators
- relevant and ongoing professional development to foster the meaningful integration and innovative use of technologies to meet the needs of diverse learners; and
- appropriate "one-to-one" or periodic access to computers for students, rolled out in a phased plan a the high school, middle school, and elementary school levels.

Wayland Technology Task Force Goals
Accessibility of Technology – 2008-2011

Hardware and Software Access – Curriculum Support

- Roll out teacher and student computer initiatives.
  - The netbooks purchased in FY10 are more than adequate for a number of curriculum projects that are web-based and/or tied to basic Office applications. They have also been very successful with HTML programming at the High School. We will continue the use of thin clients, netbooks, Macs and laptop PCs to meet the needs of the curriculum integration requirements.
- Integrate hand-held devices into instruction, including data probes for science instruction and general devices for research and 21st century communication and collaboration skills.
- Assess additional hardware and software resources to support individualized instruction to meet the needs of general and special education students alike.
- Install one projector in every classroom.
- Expand the use of interactive whiteboards and document cameras.
- Develop a five-year replacement cycle.
  - 45.2% computers are five years or older and should be replaced.

Internet Access

- Perform a comprehensive evaluation of the network infrastructure and network servers to identify performance issues.
- Determine how to redesign the network to most optimally support our schools.
- Work with Town Government to contact local carriers to negotiate support in creating a high capacity town-wide WAN.

Networking

- Due to the HS's campus setup, the wireless network needs to be upgraded.
- Upgrade backup system and look at offsite contracted services.
- 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.

Project Planning

- Networking infrastructure assessment
- Upgrade wireless at all schools
- Server infrastructure assessment
- 5 Year Replacement Cycle Plan
- Teacher Computer Initiative (TCI)
- Student Computer Initiative (SC)
  - Access
  - Financing
  - Support
- Technology-enabled Classroom Initiatives
  - Projectors, interactive whiteboards, document cameras
  - Handheld devices
- Individualized Instruction Initiatives
  - Online Software

Wayland Capital Technology– Actual Spending FY10

FY10 – Capital Expenditures / Explanation Description	Initial Request	Projected Cost
Replacement of 50% of out-dated computers (300 Computers) Computer Labs & Laptop Carts, Classroom Computers Computer Replacement cost $500 / computer	300,000	170,000
Fiber Dedicated (Schools & Town) Loker, MS, HH & High School	0,000	85,000
*Network Controllers, Switches & Wireless Access Point Hardware Happy Hollow, Claypit Hill & Loker	110,000	100,000
*Network Server Consolidation & Upgrade – Microsoft Exchange Server Network Infrastructure to Support Apple & Microsoft Computers: hardware, software, and related installation costs	280,000	150,000
Teacher Computer Initiative (TCI; Switched FY09 Network upgrades with Laptops for teachers.) High School, Middle School & Loker Teachers – 25 @ $1,200	50,000	45,000
Peripherals: projectors, interactive whiteboards, printers, iPods, etc.	10,000	0
	$750,000	$550,000

List Price for FY10 Juniper donations: $219,250

Wayland Public Schools Foundation - Technology Donations: $39,120

FY10 Remaining Funds: $20,000 in Network Server Consolidation

Wayland Capital Technology Planning – FY11 Request

	FY11 – Capital Expenditures / Explanation Description	Cost
1	Fiber Installation – High School – Central Office – Claypit Hill School (Note: Includes Town Building, Police & Library Buildings, completes this initiative)	100,000
2	Teacher Computer Initiative (TCI) Happy Hollow, Claypit Hill, SPED Teachers – 100 @ $1,500 / computer	150,000
3	Replacement of out-dated computers and peripherals Computer Labs, Laptop Carts, Classrooms, Offices (500 computers were purchased before 2006)	225,000
4	Data Center / Network Expansion Additional Switches, ports and Access Points for additional computers, Central Office Upgrade *(60,000 ongoing)*	100,000
5	Computer HS pilot - Student Computer Initiative Average cost: $1,000 / computer	25,000
		$600,000

Wayland Educational Technology Planning – FY11 Notes

1) **Dedicated fiber installation** cuts costs and improves performance through centralized services and improves educational resources through virtualized program access. It has also allowed us to introduce Thin Client computing not only on new computers but also on older MAC computers, thus extending the life of our old, out-dated computers. Long-range savings will be incurred from improved performance, reduced hardware needs and easier centralized IT management of expanded usage. The proposed $100,000 completes the fiber installation; there will not be FY12 and ongoing costs in this area.

   Note: Industry ratio for support is 60-125 computers:1 technician, depending on the number of operating systems supported, the use of centralized management capabilities and technical expertise of users. Our current ratio is 300:1. A centralized and virtualized infrastructure will help with our ability to support expanded computer use in the District.
   - 1250 used for Teaching and Learning, 100 used for Administration
     - 800 MACs, 2 operating systems
     - 550 PCs

2) The **Teacher Computer Initiative (TCI)** empowers the teacher to develop rich lessons through the use of technology and provides professional development on computer maintenance and use. As teachers build their expertise they will continue to use the technology for interactive instruction, assessments, and remediation. This is an important step in developing a school system that fully incorporates 21st century teaching and learning methodologies. In particular, the District will focus on teaching approaches designed to meld with the FY11 Student Computer Initiative (see 5, below).

   Ongoing cost: The NEW Teacher Computer Initiative (TCI) places computers in the hands of all teachers and empowers them to develop new teaching methodologies. It is necessary to also account for support staff and administration to effectively run a school system. Though there are 429 staff in Wayland Public Schools (Staff Deployment Report 2009-2010), we are estimating our total computer costs for 216 teachers and 84 support and administrative staff for a total of 300 computers. With a five year replacement cycle, it is necessary to budget $60,000 / year for teachers and staff. We are budgeting more in FY11 and FY12 to implement this NEW Teacher Computer initiative and to catch up on our underfunded support staff and administrative replacement cycle.
   - TCI FY11 & FY12 $150,000
   - Yearly TCI Cost Beginning FY13 $90,000

3) The following statistics reflect the computers in our inventory that were purchased before 2006 and need to be replaced in 2010. This request to replace approximately 275 computers is less than what we truly need, which has been true for a number of years (that is, annual technology investment has not been able to keep pace with obsolescence). The $1,000 cost for **replacement computers** reflects a higher cost because some of the computers needing to be replaced are administrative computers and/or MAC computers and will cost more than the originally estimated $750 to replace. The $1,000 is an average cost for computer replacements. Please note that this request does not include an expansion of student computer access, which is greatly needed in all schools. Replacement computers have no resale value, and are instead recycled.
   - 300 MACs (2005 and older)
   - 200 PCs (2005 and older)

4) The **Student Computer Initiative (SCI)** is the beginning of a model 21st century school design in preparation for the opening of the new High School in 2012. The goal is to expand on teaching and instruction at the High School with online project based methodologies that are similar to those used in higher education and the workplace. The plan for FY11 is to implement student computer usage in a systematic way based on current efforts (see the second link under question 5 in the "Answers to frequently asked questions" section later in this document).

   A pilot-scale initiative will provide students with computers for in-school (not take-home) use from "pools" of computers available in selected departments. The pilot will integrate current and new classroom instruction with the use of a Course/Learning Management System/Virtual Learning Environment such as Moodle (http://moodle.org/). This will foster a movement to instruction that is rich with online resources and 21st century teaching and learning methodologies. Professional development for teachers will focus on the use of the Learning Management System to support the blended/hybrid/online learning integration.

   The objective of the pilot is to define a broader, comprehensive implementation plan for all of Wayland Public Schools, whether via the pool approach or a true student 1:1 initiative in which students would be assigned computers for school and home use. In addition, the District will experiment with student/family supplied computers with an eye towards having students supply the majority of computers, redeploying the District computers to those students who do not have or choose not to use student/family supplied computers. The District will also pursue private fund-raising, for instance from alumni and/or local/national companies, to partially offset the cost of the SCI.

   Implementation details: (a) Technology will be fully integrated into the Curriculum. (b) Professional Development for Teachers will include an introduction to the Learning Management System and the delivery of Hybrid Professional development over the summer focusing on 21st century teaching and learning methodologies. We will offer PD in-house, through the Learning Curve, VHS, and/or other online course options. (c) Five teachers will work together in an Inter-disciplinary Professional Learning Community to craft implementation plans and strategies that work well for future growth in our Wayland Community. They will document successes and failures and share with the entire staff. (d) All students involved will sign an acceptable use policy and take a pre and post assessment based on Technology Standards required by the State of MA for all graduating seniors.

   Ongoing cost: The assumptions that follow assume eventual 1:1 implementations at the MS and HS levels and computer pools at the ES level. Costs will be lower with a pool-based implementation at the MS and/or HS levels, with family supplied computers, with private-fundraising, and/or with a combination of these approaches.

   The Student Computer Initiative (SCI) has two distinct plans. In the Elementary Schools, the plan is to maintain two computer labs and eventually a pool of five computers in each classroom for a consistent 'workshop model' integration. This represents 380 classroom computers and 130 lab computers for Claypit Hill, Happy Hollow and Loker Schools. If we reach that goal, the 5-year replacement cycle would be $102,000/year.

   An eventual 1:1 SCI implementation (the high cost alternative) would see 900 computers at the High School and 600 at the Middle School. The 5-year replacement cycle for such an implementation would be $300,000/year.

- FY11
  - SCI High School Pilot $25,000
- Yearly SCI Long Range:
  - Elementary School $100,000
  - Middle and High School $300,000

5) Additional **data center upgrades** include a centralized management system and engineering for software deployment, asset management, patches and maintenance of our MAC and PC computers. Network expansions are needed throughout the District to increase our wireless access to expand internet access in classrooms and study areas. This includes the need to add switches, activate ports and add access points. A Central Office network upgrade needs to be completed to bring the support and maintenance of Administrative computers to the centralized data center that will be connected by way of the newly installed Town fiber. Of the requested $100,000, half supports the parallel municipal initiative. Ongoing school costs in this area are estimated to be $60,000/year.

6) Funding is requested for **peripherals**, including projectors and projector replacements, interactive whiteboards, interactive response clickers, and other technology resources used to engage students and enhance teaching and learning.

7) **Professional Development** initiatives (funded in the operating budget) focus on integrating technology into all curriculum based training. Teachers develop lessons using the technology based resources and learn as they do so. In a recent training session on Everyday Math, teachers brought laptops and learned how to install the teacher component and how to use the online resources for teaching and learning. Technology instruction was integrated into the curriculum instruction. Wayland's Integrations Specialists also work one on one with teachers to assist them in incorporating lessons that are rich with new technology resources and provide before, during and after school sessions for teachers. Many teachers are signing up for Virtual classes for teachers through VHS. (http://www.govhs.org/Pages/ProfDev-Home) and through other resources (http://wayland-pd.wetpaint.com/page/Fee+Based+Online+Courses) Our first Annual Digital Boot Camp was held in August 2009 and teachers attended these sessions to learn about Google Gmail and Google Applications for use in administrative and instructional settings. We plan to begin our own online Moodle (http://moodle.org/) initiative for teachers for Professional Development in FY11.

8) A key element of the technology rollout is the adoption of **measures** to track success. These measures will be of both the input and output variety. Candidate measures to be explored include but are not limited to those in the list that follows. The district expects to refine these measures over time, with a particular focus on developing output measures that more precisely target the effect of technology: for instance, through assessment built into distance learning courses and interactive software. In the end, though, the intent of technology integration is to improve overall performance while reducing cost.

   - Input measures
     - Number of teachers receiving technology professional development
     - Hours of teacher technology professional development
     - Number of classes with curricula available via Moodle
     - Total and per capita student time logged in
     - Number of student Google documents
     - List of Virtual High School (VHS) and TEC Online courses taken
     - Number and credits of VHS and TEC Online courses taken

- Output measures
  - Technology-specific
    - Assessments included in distance learning courses
    - Assessment built into individual interactive software programs
  - General
    - Per pupil expenditure: to measure cost-effectiveness, tracked against peer districts with and without technology initiatives
    - MCAS and SAT scores: to measure general curricular improvement
    - Student results in co-curricular competition: e.g., debate, science Olympiad, robotics, drama, music, art, etc.

9) Models for technology-driven **cost reduction** are primarily conceptual, although national efforts such as Project Red (www.projectred.org) are exploring exactly this question. Here are two models for how cost reduction may occur.
   - Traditional classroom versus distance learning (e.g., Virtual High School)
     - **Traditional**: a teacher with a $75,000 salary teaches 90 students across a school year, resulting in an $833 per student per year cost
     - **Distance learning**: Wayland pays a $6,000 online fee and provides a 0.2 FTE teaching position (same $75,000) to allow 50 students to take an online course, for a total of $21,000, for a $420 per student per year cost, about half that of the traditional course.
   - Traditional classroom versus interactive software
     - **Traditional**: a student takes 5 teacher-led classes per day, at $833 per class from the first example above, for a total of $4,165.
     - **Interactive software**: a student replaces 1 of the 5 teacher-led classes with individualized instruction from interactive software. Hardware and software cost is approximately $1,600 with a 4 year life, or $400 per year. Cost is 4 x $833 = $3,332 for the teacher portion plus the $400 computer cost for a total of $3,732, a savings of $433, or 10%.

Summary

Parallel to cost saving measurements, it is paramount that we understand that the landscape of our world has changed, and thus education, teaching and learning, must change to meet the needs of our learners today and into the future. In reflecting on the closing statement of the Wayland High School Mission Statement, we cannot meet this goal in the 21st century without a teaching and learning environment that is technologically rich with related opportunities in every part of the school experience.

> Our goal is to **advance our students' growth into principled, informed, and capable citizens** who will help guide a democracy that follows humanitarian principles in the global forum, and shape a just society where individuals may reach their full potential.

We are responsible for preparing our students for a world of school and work beyond our walls and that world is globally and technologically competitive. Today, "Principled, Informed and Capable Citizens" must be globally and technologically savvy. We must be committed to providing an educational environment that provides these technologically enriching learning opportunities.

Answers to frequently asked questions

Q1: With the Student Computer Initiative, will students be taking district supplied computers back and forth to school?
A: Perhaps, although not with the initial pilot.

Q2: Will the district have coverage to mitigate against lost, stolen, or damaged computers?
A: Yes.

Q3: Are there network security concerns involved with having student supplied computers operating within the school environment?
A: None that aren't manageable, as the district's network infrastructure is being designed with this use in mind.

Q4: Will provisions be made for students who do not have Internet access at home?
A: Yes, via wireless connection cards, district provided cable/FIOS connectivity, or other means.

Q5: Where can I learn more about Wayland's use of educational technology?
A: Please visit
http://www.wayland.k12.ma.us/district/district_info/departments/technology_office/index.htm
and
http://www.wayland.k12.ma.us/district/district_info/departments/technology_office/DistrictTech.htm