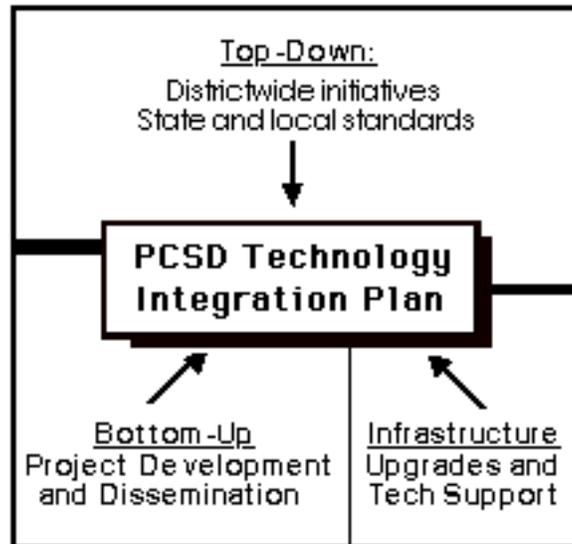# IMPLEMENTATION PLAN:
Poughkeepsie City School District Technology Plan
1999-2000

Introduction:

Although the Board adopted the Technology Plan last year (available on the web at www.pcsd.k12.ny.us) it did not approved funding, though a budget was submitted. Hired this August, I was asked to develop a staged implementation plan, modified as funding became available and as technology changed over time. The work plan which follows is essentially a footnote to Phase One of the Technology Plan. Its goals and objectives are drawn from the Board-approved document, but strategies and timelines are different, and in some cases the scope of work has been reduced.

I hope to organize a districtwide initiative to fund a significant infusion of capital into this plan in the future. A leveraged bond issue could move this process along more quickly and thoroughly. In the meantime, interested members of the district Technology Planning Group are using online conferencing to review modifications as they are made, and this work-in-progress will continue to evolve.

- Bram Moreinis
Director of Technology, Poughkeepsie City School District

Articulating/Revising Phase I:

Internal Wiring (Building LANs, with connection to District WAN): In the originally approved Phases 1 and 2, implementation was targeted to occur systemwide simultaneously: all schools attaining the same levels at the same times, for the sake of equity of access. However, this scope of work cannot be accomplished simultaneously in all buildings over one summer, for reasons beyond the $100K per building cost. "Wiring" means extensive cabling and construction, and installation and configuration of machines and networks in all spaces. This is a highly complex and disruptive process which we need experience with before contracting for multiple sites at once.

Our E-Rate award from this past year, the seed money for wiring (in lieu of additional funding not approved this year) was sufficient only to wire one building, which is not inappropriate. Wiring one school to start with gives the District an opportunity to experience the process and develop expectations and contingency plans, making more accurate estimates of time and issues as more buildings are wired in the future. In capital projects, Dr. Jamieson has articulated the principle of "working downward": students should not be deprived of resources as they move up grade levels. Currently, the middle school is partially wired, with four labs which will be internetworked and on-line by September. The high school was therefore chosen to be wired first, building on middle school experiences and practices

The following summer wiring schedule is proposed for Phase One. As more money can be made available for technology, a wider scope of wiring can occur. For the three-year wiring plan, it is hoped the Board will approve the necessary funds for downpayments of 20% per job, as E-Rate can be expected to cover the remainder.

Three-Year Plan: Wiring the Buildings (Proposed)

1. Summer 2000-2001: PMS, Administration
2. Summer 2001-2002: Smith, Krieger, Warring
3. Summer 2001-2002: Clinton, Morse, Columbus

Purchase and Installation of Equipment:

Timing of Large-Scale Purchasing/Deployment: Because E-Rate funds cannot be applied to the purchase of computers, their cost will be a significant outlay by the District. However, computer purchases are 60 percent aidable through BOCES, though they take a few months to arrive. Purchase through loan provides the most leverage for a school with a small yearly budget: with a $3000 per year payment for a four-year loan of $12,000 the second year's payment would be only $1,200; the third year, $480, and the fourth year, $192. $12,000 worth of equipment would therefore have been purchased for $4872, because of BOCES aid. These loans need to be arranged before the end of a school year, in order for equipment to be available the following September.

Incremental Deployment: Although Phase 1 calls for "a computer in every classroom", it is often unwise to purchase computers before they are ready to be used by all staff. Purchasing before readiness is the most common error made by district-driven technology plans, and often results in community reluctance to continue investment through bond issues, as occurred this year in many neighboring districts. It is estimated that for business, computers have a shelf life of 30 - 36 months at present. For schools, a five-year shelf life may be more accurate. For example, the first Pentium machines introduced in 1995 cannot run Windows 98 at a comfortable speed today. One may therefore add 1/3rd of the purchase price of a machine every year that it is not used as intended. To guard against the misspending of technology funds, accurate assessments need to be made about which teachers should receive how many computers when.

Technology Planning Committees: Building level teams are in a better position than central administrators or principals to determine whether and when to purchase computers to be used immediately and effectively in classrooms. Within a building, a principal alone may not have the time to ascertain where each teacher is in relation to instructional computing, or to juggle the many complex issues involved in deploying equipment in support of a building vision. Consensual planning by a building committee can bring enough information to enough people to make appropriate and welcome decisions about computer deployment. Technology planning committees in each school should ideally include the Principal or administrative designee, the building turnkey, computer teacher (or T.A.), librarian, PPSTA representative, and classroom teachers (representing grades or departments). Committees should also decide when to include additional stakeholders (parents, student,teachers) to increase buy-in and support for their efforts.

With respect to purchasing machines, each building's technology planning committee should determine whether or not the faculty of a given grade or department is ready to move ahead as a unit, or whether to install computers on a teacher-by-teacher basis. At the point where every teacher has a computer, every student has access to a lab, and portable "cadres" of rolling computers are available for classroom loan, a building can be said to have completed Phase One. *In the meantime*, growth must be staged, based on building goals, readiness, and available funding. When lobbying for more funding, committee members should be able to explain how computer-enhanced learning environments provide necessary opportunities for improving student learning in their buildings. This level of advocacy and support can only come from those who themselves understand the issues and solutions, who have made the time to learn about and plan for technology integration in their buildings.

Stages for Individual Computer Deployment: When a computer is first purchased, it is generally "state of the art". Because teachers can best learn HOW to use computers to support instruction when they can train together regularly on-site, the best first stop for new computers should be a computer lab where both teachers and students can learn current software. In years 2-4, computers should be moved to individual classrooms of teachers who have learned to use apply them effectively to improving student achievement. By year five, the computers will be fairly out-of-date, and it will be time to replace them with new machines following the same cycle. When classroom machines are upgraded, the replaced machines can be moved to "cadre" roller-systems or limited-use labs. Both PMS and PHS have older machines in word processing labs, and newer machines in labs with some degree of Internet Access.

Buildingwide and Districtwide Deployment: A benchmark date may be set when completion of Phase One has occurred in each building. In the late stages, a building may decide to put computers in all classrooms regardless of readiness. Planning for such "forced use" of computers will involve commitment to extensive inservicing of faculty, and other issues regarding job expectations. Schools at this stage should adopt a series of mandatory in-services to make sure all teachers use their machines correctly. Moving teacher building-level administration functions to the LAN (such as ordering supplies, instructional planning or information sharing) can occur once everyone has access and training.

Once each building has achieved the Phase I benchmark, it can be attained districtwide. When every teacher has become comfortable using the computer in his or her charge, instructional administration procedures can be converted to digital means for all district teachers (such as grade submission, program coordination, attendance reporting or referencing of policy materials), and technology learning objectives can be adopted building- or district-wide.

Planning Issues: Additional Expenditures Not Currently Budgeted

School Labs: Given the deployment stages above, a "state of the art" lab for the first year and a "limited use" lab as a "pre-retirement" option should be planned for in schools with sufficient space. Though secondary schools require more labs than these, each elementary school should identify two computer rooms (one for a "Learning Lab" and one for a "Word Processing Lab") and equip these spaces, when feasible, with the following preparations made:

1. **Furniture:** Improper posture can cause lasting damage to the neuro-muscular systems of growing bodies. Appropriate furniture should be part of any computer purchase, not an afterthought.

2. **Ventilation:** Provision has not yet been made for upgrading of electrical and HVAC systems. Although all spaces should be ventilated and cooled sufficiently to provide high productivity, computers are especially vulnerable to "crashing" when overheated.

Power: It is illegal to connect computers in classrooms to power outlets via extension cords. Short power strips are permissible but also dangerous. It is important to upgrade the level and access to power before computers are purchased, so that they may be used as they are deployed. A district goal in construction and renovation should be ensure adequate power in every classroom for at least five computers.

Staff Development and Technology Planning

In any organization, there are different levels of readiness in staff for new methods and practices. The move toward adoption of new practices is a process termed "acculturation," generally characterized in four levels. At the front line of adoption of technology are the Pioneers, those who will struggle with the new and challenging regardless of the level of support or peer involvement available. Following these are the Early Adopters, who watch and, when ready, adapt what they've seen working to their own settings. "Mainstream" individuals change when the majority of those around them appear to be changing as well, following the group norms. Lastly are those who are "Resistors", requiring a mix of compulsion and incentive to do change with the times.

The move to districtwide technology integration will not be accomplished all-at-once by a well-crafted paper document and a massive infusion of funding. A **Top-Down** initiative to infuse technology into the life of our school system should occur in conjunction with the **Bottom-Up** readying of staff for the management and use of that technology, and with a commensurate increase in the degree of technical **Support** available for teachers as they afford themselves of these opportunities. One makes best use of "human capital" when pioneers and early adopters are given the opportunity and support to influence those who are on the nearest rung below them, rather than by putting the burden on a few experts to serve all others. This is often called "organic growth," a process more easily "owned" by those who will have to participate most actively within it. To use metaphors, top-down initiatives water all plants in a garden equally and provide fertile soil; bottom-up initiatives identify the best plants for harvest and seeding.

In 1998, $40,000 in "Seed Money" was set aside for the purpose of preparing for the implementation of the Technology Plan; $50,000 was budgeted in 1999. This is an extremely small sum to support "Top-Down" efforts, and has been focused instead on the "Bottom-Up" strategies of involving more teachers as they are ready, funding projects that are likely to succeed and function as models. New programs in 1999 include the Technology Turnkey Trainers, the Tech Scouts, development of a Technical Support Website, a new Inservice Intensive called TFT2000, the creation of a "cyber-librarian" at the middle school, and Technology Pioneer Minigrants developed with this year's Technology Plan Seed Money. The successful development and dissemination of projects which model the best technology practices of our teachers is underway, with increased building-level "just-in-time" support of classroom technology making the process more reliable and effective.

Bottom-Up: Pioneer Projects

District "technology pioneers" are teachers who have made a personal commitment to master computers as teaching tools. Their groundbreaking efforts inspire colleagues who are eager to adopt innovations in their own settings. Broadening the efforts of our technology pioneers seems an appropriate first step toward implementing a Technology Plan in Poughkeepsie. Drawing on the successes of their colleagues will help our teachers grapple with the collective task of technology integration into instruction. For this year, $40K in seed money, matched by funds from grant sources and the district funding for extra service positions, has been sufficient to maintain support for this gradual project-based growth. It has funded the highly successful "Technology Pioneer Minigrants," which will become the model for similar efforts in the future.

However, project-by-project growth will not meet the needs of all our students, and is no substitute for the level of technology growth called for in the District Technology Plan. A top-down initiative to infuse technology into the life of our schools, in conjunction with the bottom-up development and dissemination of projects which model the best technology practices of our teachers, and maintained by centralized and building-level technology planning and support, must all work in conjunction to achieve the goals of our technology plan.

School-based technology planning committees and turnkeys are critical to this process, as are the district technicians who support and train them to provide the in-time, on-site services they are positioned to.

More Projects Mean More Support

On a project level, technology integration is speeding up in the district, and the capacity to support that development is being increasingly called for. Most buildings in the district can boast a handful of educators skilled in the use of technology, hosting activities and projects that significantly improve student learning there. Pioneer minigrants this year, including GLOBE (PHS, PMS, Krieger), Heritage (PMS), Oaxaca (Smith), Multimedia Music (PMS) and others, have all gone beyond word processing to create learning experience that would not be possible without classroom computing. These are recent and developing efforts and constitute good news for our students.

Additionally, this year the Technology Literacy Challenge Fund (Title III) has powerful computer equipment to our elementary schools through BOCES. BOCES will supply no equipment before educators have been trained, and only within the context of specific deliverables the equipment is intended to support. This should facilitate many new faculty joining the ranks of early technology adopters. Finally, the Goals 2000 program with Arlington has supplied 10 middle school teachers with state-of-the-art machines, who are eager to learn how to use it for professional collaboration as well as classroom support.

However, these new development require a level of professional support and just-in-time technical support that is increasingly beyond reach of our human resources as they are currently used. Tech Central is unable to service the increasing demand for installation, repair and training, and there is not yet a provision for each building to develop its own in-house computer support teacher. More still needs to be done for technical support and training if continued gains are to be made. This is particularly true for teachers who do not have a high degree of familiarity or comfort with computers, either as personal productivity tools or as classroom aids.

Reorganization of our resources to support the current level of increase in technology use has begun with only a moderate increase in funding, supporting the following areas:

1. The Technology Turnkey Trainers: an extra service position, assigning one teacher or aide per building
2. The Tech Scouts, students who are rapidly learning the hardware and software support skills needed to support computing in our buildings
3. An increased use of email and web-based conferencing for collaborative planning and information sharing
4. A proposed boost in staffing, salaries and operating budget for computer services department for next year

The increases in the budget proposed for technology services would continue the growth of these initiatives, and move the district slowly and organically toward its overall goals for technology integration. However, a more significant increase will be necessary if the Technology Plan is to be implemented as planned.

Conclusion: Implementation Strategy

These efforts above made to develop the degree of cultural readiness needed to maximize the impact and cost-effectiveness of district expenditures on hardware and networking. Following the technology plan approved in 1998, many ambitious goals have been affirmed for subsequent years; however, as technology use levels increase, the infrastructure (particularly in repair and technical support) must keep pace. There are significant choices to be made in levels of funding for next year, depending on the pace of change and level of educational opportunity the district is prepared to commit to. After such an examination, the following are the most essential expenditures necessary to ensure the success of district technology growth:

> 1) <u>Put a Computer Teacher in every school</u>:
> Many teachers and classes whose schools share a computer teacher or teaching assistant with other schools can meet only once a week, which is too infrequent to support significant growth.
> 2) <u>Hire a third District Computer Technician</u>:
> With the need for network administration, extensive new training, and support for the increasing number of machines, it is impossible for two technicians to meet support needs in a timely or complete way.
> 3) <u>Develop appropriate job descriptions and salaries for existing Computer Technicians</u>: As they acquire the training and experience necessary to support current and evolving technology, our technicians become more attractive to schools and businesses where much higher salaries are standard.

These increases will support the incremental growth currently underway in the district. A significantly higher increase in funding would be needed to accomplish Phase One of the technology plan by 2002, however. Such an increase can only come from increasing advocacy and pressure from administration, faculty and community affirming the importance and value of computers in the classroom. Sharing experiences of this value with other teachers and administrators who participate in technology planning committees will convey the need to make technology a higher priority, and to draw down more funding for technology during budget time.

Objectives by Budget Year

1998-9 Seed Money: Establish groundwork for Technology Plan ($85K includes matching funds from other sources)

1. Promote sound practice through developing model pioneer projects
2. Develop human resources needed to implement Technology Plan (Turnkeys, Tech Scouts, etc.)
3. Extend LANs in PMS, PHS to support projects and teacher training
4. Develop District Technology Planning Conference to inform process
5. Increase District awareness of value of classroom technology through Inservice Courses

Threshold Issues:

1. Funded projects clearly demonstrate application of state standards (see www.pcsd.k12.ny.us/projects)
2. Turnkeys, Computer Teachers, Technicians and Tech Scouts can keep up with increasing demand

1999-0: Focusing District Awareness on Technology Integration ($350K)

1. Superintendent's Initiative: conference days with technology focus
2. Extend and disseminate model projects as state standards examples
3. Increase capacity of Tech Central to support technology infusion (New Technician, A.V. Technician)
4. Stage 1 of District WAN (BOCES): Wiring of PHS
5. Full-Time Computer Teachers/T.A.s hired for all buildings

6. District co-hosts regional technology conference

Threshold Issues:

1. Technology Transfer from Pioneers to Early Adopters in minigrant initiatives is successful.
2. Technical Support meets classroom demand.

Addendum: Excerpts from Budget Proposal for Adequate Support of Organic Growth
Technology Budget Submitted Within PCSD Budget: 1999-2000

Item Description	Amount	Justification/Note
Equipment Instructional	42,000	Categorical
Equipment Lease	*22,500*	*Apple Lease, Third Year*
Contractual Computer	24,000	
Computer Repairs	*20,000*	*Increase proportional to equipment*
Computer Supplies	10,000	Increase proportional to equipment
Instructional Software	63,200	Categorical
Software, Non-Inst.	6,500	Administrative
Overtime	*14,000*	*Overtime for Technicians if no new technician hired*
Seed Money	50,000	Double $25,000 Mini Grant Support/Dissemination Funds
ADDITIONAL REQUEST:		**INITIATING PHASE ONE**
Additional Computer Technician	35,000	Current Tech Central Technicians do more training of other staff
Technology Teacher (PHS)	45,000	New Teacher
Computer Teacher (Krieger)		Transfer Irene Yozzo (F/T)
Computer Teacher (Warring)		Transfer Linda Dean (F/T)
Computer T/A (Clinton)		Transfer Chris Arnfield (F/T)
Computer Teacher (Columbus)		Transfer Elaine Miressu
Computer T/A (Morse)	18,000	New T/A Needed
Computer T/A (Smith)	18,000	New T/A Needed
District A/V Technician	18,000	Needed (James Neill is only available after school)
Total, Phase One, 1999-2000	171,000	Does not include E-Rate Items