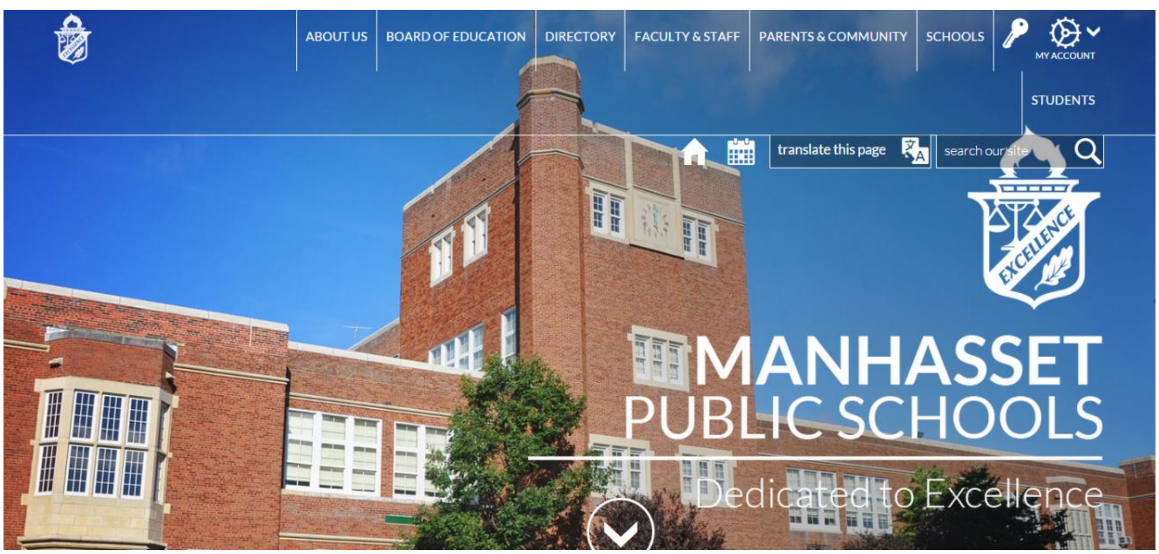
MANHASSET UNION FREE SCHOOL DISTRICT

200 Memorial Place

Manhasset, NY 11030

TECHNOLOGY PLAN

July 1, 2016 – June 30, 2017



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Years Covered:	July 1, 2016 – June 30, 2017
URL:	www.manhassetschools.org/TechPlan

EXECUTIVE SUMMARY

Purpose of the Technology Plan

The purpose of the Manhasset Technology Plan is to outline a shared vision of the use of technology to improve the overall educational experience of students. The plan also considers the technology needed for the overall non-instructional day-to-day needs of the District. In both cases, technology will best serve end users by providing students, teachers, support staff and administrators with access to appropriate tools and training. Technology is used to clearly communicate with and involve parents/guardians and community members in the school's ongoing mission:

The Mission of the MANHASSET PUBLIC SCHOOLS, in partnership with the Manhasset Community, is to develop all learners into exceptionally capable citizens functioning at their highest intellectual abilities and willing to commit themselves to successful achievement which benefits the larger and constantly changing society. In order to achieve its mission, we, the Manhasset Public Schools, will continually strive to create a secure and inclusive learning environment, which recognizes all learners, faculty and staff as unique human beings to be treated with dignity and respect.

Recognizing the dynamic nature of technology, our plan is flexible in order to best respond to new opportunities as they present themselves during its lifespan. Through all areas of the plan, we seek to provide all end users with reliable and relevant access to information technology resources.

Vision

Today technology is woven into the fabric of teaching, learning and living. In order to maximize the potential of instructional technology it must meet a RARE criteria – it must be: Reliable, Accessible, Relevant, & Effective

- Reliable –In order to insure the reliability of the technology offered, the District has made an ongoing financial commitment to the necessary installation, maintenance and rotation of equipment on a timely basis
- Accessible – Access to technology has two dimensions – physical access to a tool and cognitive access that empowers one to be able to use that tool. The District is committed to both.

- Relevant – technology should NOT be used for the sake of using technology. It should be organically integrated into the curriculum as outlined by the TPACK (Technology, Pedagogy, and Content Knowledge) and SAMR (Substitution, Augmentation, Modification, Redefinition) frameworks.
- Effective – technologies that are chosen for use by the District should have value to end users such as decreasing the time needed for a task while improving the quality of the outcome.

Acknowledging the powerful role that technology currently plays and will continue to play in the lives of all persons, we believe that users of technology:

- Need to be taught the ethical and moral implications of the use of technology
- Should be empowered by their use of technology to:
    - Become more aware of the world around them
    - Access accurate and relevant data to inform their decisions
    - Enrich their lives

Goals

- Provide students, teachers and all staff with more opportunities to develop their digital literacy
- Increase access to mobile computing devices
- Continue to provide all with access to relevant developing technologies
- Overhaul wireless infrastructure
- Investigate and pilot an effective Learning Management System

Planning Process

The planning process in developing the Manhasset Union Free School District Instructional Technology Plan began with a review of past plans by the Director of Technology and the Computer Network Administrator. The plan presents a snapshot of the District's current technology and goals for future development. The snapshot was updated to reflect infrastructure and end user changes implemented since the previous plan.

This plan was then reviewed and revised at various technology committee and department meetings held throughout the year. Students were invited to specific meetings to gather their input and feedback. In the spring of 2014 an Exploratory Mobile Computing Committee (EMC^2) also met several times to focus on developing a criteria for what classroom teachers would like to see in a mobile computing device. This was done to enable us to focus on the important characteristics of such devices vs choosing the latest technology hardware in order to keep up with the ever changing landscape of mobile computing devices. The key characteristics of: battery life, physical keyboard, clamshell design, portability and ease of management were chosen. In November 2014 meetings began with the executive board of the High School's alumni organization, the Manhasset Tower Foundation, to discuss the purchase of devices for the 2015-16 school year.

In addition to these groups, input was gathered from all members of the Secondary School ELA department as they were to be the recipients of the mobile computing devices. They helped to choose the model of the device (Acer Chromebook) as well as the storage lockers.

The cumulative results of these various meetings are reflected in the final technology plan. The District has landed on using Chromebooks as its mobile computing technology in the current and coming year. It has also selected Google Classroom as a platform for the ELA department to use in conjunction with Google Docs.

The District will also continue to use VMWare for both server virtualization and deploying virtual desktops. Additionally, last year the community approved financing the installation of a Voice over Internet Protocol telephone system as part of a larger District Wide Capital Improvement Facilities Bond. Finally, the District's Teacher Resource Center agreed to help fund and facilitate professional development for Google Classroom and Docs in the 2014-15 and 2015-16 school years.

This plan includes the following sections, as per the New York State Education Department's Technology Survey:

A) Local Educational Agency (LEA) Information

The Manhasset School District has an enrollment of 3336 students in the following grade bands:

GRADE BAND	ENROLLMENT
Grades K-2	675
Grades 3-5	710
Grades 6-8	853
Grades 9-12	1085

There are two K-6 elementary schools (Munsey Park Elementary School and Shelter Rock Elementary School) and a Secondary School that houses the Manhasset Middle School, grades 7-8, and the Manhasset High School, grades 9-12.

The Manhasset Public School System has a long-standing commitment to excellence in education. The rigorous academic program is aimed at helping each student reach his/her full potential. The curriculum features a highly acclaimed academic, arts, extracurricular and sports emphasis, together with a strong integration of computer technology across all grade levels and subject areas.

Manhasset educators recognize the importance of providing a wide range of enrichment opportunities. Participation in the Academic Enrichment Program is based upon student aptitude and performance. The program is organized within a trimester format which consists of three 8-week sessions. Students can be identified for one, two or all three terms based upon annually established criteria. At the senior high level, independent research skills programs in science, math and humanities are available.

Students are encouraged to participate in local, state, regional and national competitions in the five major disciplines (English, social studies, science, foreign language, and math) as well as music and drama contests. The success of the Manhasset School District's program is demonstrated, in part by the following statistics. Manhasset's high school dropout rate is lower than 1%. Over 80% of the student body actively participates in extracurricular programs. Forty-five percent of MHS students take advanced placement or honors courses. Ninety-five percent of the 2015 high school graduates enrolled in either two or four year colleges.

The Manhasset community has a history of strongly supporting its schools. The School Community Association (SCA), Manhasset's parent organization, provides an opportunity for parents, faculty and interested residents to work together in support of excellence in education. In addition, community members serve on citizens' advisory committees and on special ad hoc committees appointed by the Board of Education. Additionally, the not for profit, Manhasset Tower Foundation, has partnered with the District on several projects in order to meet their mission to "enrich the educational experience of the students of the Manhasset Schools." The Tower Foundation has made significant donations to support Instructional Technology throughout the District.

Historical Context

In 1997 the Manhasset School District completed the installation of its first building wide and district wide computer networks. Completed over a two year period, the network boasted 25 computers in each of eleven labs with access to CD-ROM databases, a color scanner, and a networked laser printer. The additional administrative computers brought the grand total to 300 networked desktop computers connected at a throughput speed of 10 mbps.

Today, technology permeates the entire district in ways not yet conceived of twenty years ago. Every instructional area of the District is equipped with a Smart Interactive Whiteboard, Flat Panel or Interactive projector. Every instructional and administrative area has 1 GB connection to the Network Operations Center – housing 50 servers, 45 of them virtual machines. The network has over 1,500 connected computing devices ranging from hardwired servers to WIFI connected Chromebooks.

Technology now ensures the overall security of all buildings with over 230 digital cameras, 22 HID security card access controlled doors, and a soon to be completed emergency lockout system that will provides real time access to emergency services complete with interactive floor plans. Computer bytes also play a role in breakfast and lunchtime bites as our food services utilize computerized inventory and purchasing systems allowing students to purchase food with their ID card or Personal Identification Number (PIN). In the summer of 2016 Central Office administrative services will be relocated to a renovated bus garage featuring an interactive Board Room capable of broadcasting its meetings with a few mouse clicks.

As technology continues to evolve so will the District's deliberate implementation of it – selecting those systems and tools that offer students, teachers, support staff and administrators increased opportunities to learn, communicate, and work together.

B) Instructional Technology Vision and Goals

The purpose of the Manhasset Technology Plan is to outline a shared vision of the use of technology to improve the overall educational experience of students. This will be accomplished by providing teachers, administrators, and support staff with the tools and training needed for technology's meaningful use. Technology will be further used to clearly communicate with and involve parents/guardians and community members in the school's overall mission:

> *The Mission of the MANHASSET PUBLIC SCHOOLS, in partnership with the Manhasset Community, is to develop all learners into exceptionally capable citizens functioning at their highest intellectual abilities and willing to commit themselves to successful achievement which benefits the larger and constantly changing society. In order to achieve its mission, we, the Manhasset Public Schools, will continually strive to create a secure and inclusive learning environment, which recognizes all learners, faculty and staff as unique human beings to be treated with dignity and respect.*

Recognizing the dynamic nature of technology, our plan is flexible in order to best respond to new opportunities that may present themselves during its lifespan. Through all areas of the plan, we seek to provide reliable and relevant access to IT to the ever growing number of end-users within the School District and its community.

Vision

Technology is woven into the very fabric of teaching, learning and living. In order to maximize the potential of instructional technology it must meet a RARE criteria – it must be: Reliable, Accessible, Relevant, & Effective

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- Accessible – Access to technology has two dimensions – physical access to a tool and cognitive access that empowers one to be able to use that tool

▪ Relevant – technology should NOT be used for the sake of using technology. It should be organically integrated into the curriculum as outlined by the TPACK framework (Technology, Pedagogy, and Content Knowledge)

▪ Effective – technologies that are chosen for use by the District should have value to end users such as decreasing the time needed for a task while improving the quality of the outcome

Acknowledging the powerful role technology currently plays and will continue to play in the lives of all persons, we believe that users of technology:

• Need to be taught the ethical and moral implications of the use of technology

• Need to understand that technology must be used responsibly with awareness of its potential pitfalls

• Should be empowered by their use of technology to:

• Become more aware of the world around them

• Access accurate and relevant data to inform their decisions

• Enrich their lives

Goals

- Provide students, teachers and all staff with more opportunities to develop their digital literacy
- Increase access to mobile computing devices
- Continue to provide all with access to relevant developing technologies
- Further develop wireless infrastructure
- Investigate and select an effective Learning Management System

In support of this overall mission, the Technology Departments seeks to ensure that instructional technology resources are used effectively by students and teachers to positively impact learning. We strive to provide all teachers and students access to technology that can enhance instruction and learning as well as to provide the appropriate instruction in its use so that both groups may use such tools efficiently and effectively to gather, analyze, construct and disseminate information.

C) Technology and Infrastructure

Connectivity

In the summer of 2007, the district took advantage of a recent Nassau BOCES RFP for Internet Service Providers and upgraded its access from a T3 connection to 50 mbps. In 2014 this was upgraded to a 100 mbps connection, then in 2015 another 50 mbps was added from a different ISP, providing a teamed connection of 150 mbps while allowing failover. Additional bandwidth is available upon request through the District's participation in the Nassau Bureau of Educational Cooperative Services BO-TIE project. In this way, the District can meet the FCC recommended 100 Mbps/1000 students. One high speed access connects to the main NOC located in the Secondary School through Munsey Park the other directly to the Secondary School and is shared with the two elementary schools via a lit fiber WAN which connects the Main Wiring Closets (MWC) of each building with a 10 Gig backbone.

Remote Service Locations (RSLs) connect to the MWC in each building by fiber via a one Gig backbone. RSLs can contain Cisco switches of models 3560 and 3750. There is also a Cisco 6513 Core Switch located in RSL 2. These switches deliver 1 Gb to the desktop.

All students in grades 1–12 have unique user accounts with individual passwords. Students can access their "home directories" (network storage folder) from any networked computer within any of the three academic buildings as well as from home via Vmware View. Students are also able to access a wide variety of computer applications as well as connect to the Internet via a broadband connection of 150 mbps synchronous.

The network utilizes a combination of both physical and virtual servers as well as physical and virtual desktop computers increasing flexibility of resources and minimizing computer downtime. Network edge switch gear is standardized on Cisco hardware with the Network Cores being Avaya. Currently, the District is in the final stage of creating a mirrored Network Operations Center in Munsey Park Elementary School for disaster avoidance and disaster recovery.

Wireless Network

District has several wireless protocols available and in use. These include: 802.11a, 802.11b, 802.11g, and 802.11n. Wireless access points are located in each building with the Secondary School having

100% coverage and each elementary school (Shelter Rock and Munsey Park) having 50% coverage. All access points are managed with a wireless controller. The current access points are mix of models, some can hold 20 clients at one time and the newer ones holding about 50 clients at once.

The proposed network will add 802.11ac to the available frequencies, and with new wiring will allow for up to 2gbps throughput at each access point, while being able to handle approximately 100 simultaneous users. The new implementation will provide 100% coverage for all of the schools.

Computing Devices	**Number of Devices in Use Less than Five Years Old**	**Number of Devices Connected to the LAN**
Desktop Computers / Virtual Machine (VM)	551	551
Laptops / Virtual Machine (VM)	395	395
Chromebooks	500	500
Tablets less than nine (9) inches with access to an external keyboard	103	103
Tablets nine (9) inches or greater with access to an external keyboard		
Tablets less than nine (9) inches without access to an external keyboard	13	13
Tablets nine inches or greater without access to an external keyboard		

Peripheral Devices	**Number of devices in Use Less than Five Years Old**
Document Cameras	96
Flat Panel Displays	32
Interactive Projectors	2
Interactive Whiteboards	16
Multi-function Printers	1
Projectors	121
Scanners	12
Leased Xerox multifunction copier/scanner/printers capable of FAX and scan to email transmission	33

District Network Operations Center

The District's Network Operations Center (NOC) is located on the ground floor of the secondary school building. This location houses the vast majority of the District's data and voice backend systems including the Storage Area Network (SAN) and the Mitel digital phone and NuPoint voicemail systems. The two Dell Sonicwall NSA 6600 firewall, the Avaya VSP 8000 and the main Cisco Catalyst 6509 Supervisor Engine used for internal routing are both installed in this location.

The primary data systems contained in the NOC include the following: Two Virtual domain controllers and one Physical domain controller for authentication; Domain Name Service (DNS); and Dynamic Host Configuration Protocol (DHCP) addressing as well as the SAN solutions for data storage and recovery.

The Districts Dell Equalogic PS4100 SAN is configured to allow 5 servers access to separate and secure blocks of storage between 1 and 3 Terabytes in size. The servers that are connected directly to the SAN through iscsi channel adapters are: the home directory and shared projects servers for both elementary schools; the home directory server for the secondary school; the shared projects server for the secondary school. The final storage block is allocated for the District's email server upgrade.

Data backup and recovery is handled by a Dell DR4100 and Symantec Backup Exec 15 for the data connected servers. The NOC also contains a 6-server Vmware View cluster, which is accessed through thin client terminals or remotely by a portion of students, teachers, and clerical staff. This connects to a Dell Equalogic PS6100S SSD storage array for the storage and production of Virtual Desktops.

Vmware View is configured as a remote access portal. This allows staff and students to securely access published District applications and data from an Internet connection outside of the District.

Network Servers

- Two Dell 6600 Sonicwalls are configured as firewalls (with one acting a passive mode ready for fail over). The Sonicwalls supply security, rules and routing for internal and external requests based on client and destination sets.

- Two I-Prism proxy server filters all user web requests based on allow or deny rules as well as a daily updated subscription service of sites that fall into commonly blocked categories. These device allows for multiple levels of restriction based upon user group (eg teachers, student, admin, etc.) and type of network (wired or wireless).

- Two Dell R720s host a Vmware Vsphere structure that include over 40 Virtual servers running various tasks for the district, which connect to a Dell PS6100 for the storage and production of the Virtual Servers.

- The library server runs the Follett *Destiny* suite of applications including OPAC, Circulation Desk and Alliance Plus. This server contains the databases for the high school, middle school, and the two elementary schools.

- The District's anti-virus solution is Microsoft Forefront. All of the workstation's virus definitions and configuration settings are updated daily and automatically with the newest information.

- The District currently has a Microsoft Exchange 2007 protected by a Barracuda Spam and Virus Filter, Microsoft Exchange 2013 is currently running in a parallel mode for a 2016 cutover.

- All incoming and outgoing mail is routed to a SPAM filtering appliance, the *Barracuda Spam Firewall 300.* This server filters Spam based on definitions updated daily. Local control is available to administrators for white and black listing specific email addresses.

- A *Windows Server Update Services (*WSUS) server is in place and is utilized to deploy, update, and patch software in a more efficient manner. Deployments can be scheduled for off hours decreasing downtime without the cost of delaying maintenance.

- One print server enables centralized management of secondary schools printing.

- An Apple Power Mac server provides authentication, security and file sharing ability for a Graphics Lab with 25 Mac Pro computers in the High School and a Music lab consisting of 15 Mac Minis

<u>Greening the IT Footprint</u>

Following the launch of the Manhasset School Community Association's (SCA) "Planet Manhasset" in 2007 an environmentally conscious sub-committee "dedicated to researching and implementing ways to adopt a greener living philosophy in our schools, homes and community." Recognizing the importance of this effort, the Instructional Technology Department also has striven to approach IT purchases and practices through an eco-friendly lens.

Two specific areas addressed in this plan are the reduction of energy consumption and responsible asset management through product end of life. Energy reductions are currently being realized through the consolidation and virtualization of network servers and the use of virtual desktop devices where possible. Beginning in the summer of 2008 *Surveyor* PC power management software was installed on all desktop pcs. This product measures and reduces energy consumption on PC networks by over 30% by placing PCs into lower power settings when not in use.

Desktop Virtualization

As Manhasset continues to work towards its Virtual Desktop initiative, it has replaced approximately 600 physical desktops with Dell Wyse P25 Zero clients. These devices connect to Vmware View to provide a virtual desktop which is not only faster and more stable for the end user, the power consumption is approximately 15% of a normal full desktop machine.

Additional Access to Technology

All students in grades 7 – 12 are allowed to bring their own devices (BYOD) to the Secondary School and utilize its Manhasset Wireless Network (MWN) without registration. All access to the Internet via the MWN is filtered in compliance with CIPA and COPA.

D) Software and IT Support

Software

Over fifty software titles are available to students and staff. The most commonly used are Smart Notebook Software, the Microsoft Office Suite (Word, PowerPoint and Excel, and Outlook), VmWare Horizon (virtual desktop client software), Adobe Acrobat, Adobe Photoshop, Solo 6 and Google Docs. Additionally, students have access to several subscription software packages for instructional and research purposes. These include: Discovery Education Network, Castle Learning, Discovery TechBook, eLibrary, SIRS, Gale Opposing Viewpoints, Gale Virtual Reference Library, Pebble Go, BrainPop and BrainPop Jr.

The Manhasset School District makes available a number of operating systems including: Mac OS 10, Windows 7.0, 8.0, Apple iOS 7, Chrome OS, and Android OS. Multiple web browsers are also available including: Internet Explorer 11, Mozilla Firefox, Google Chrome, and Safari.

Virtual Desktops – Remote Access

In the fall of 2010 the Manhasset School District began offering staff remote access to the District's computer network via Citrix. In 2013, the District changes its remote access platform to *VMWare's View* virtual desktop application and opened up access to students in grades K – 12. *View* allows all users 24/7 access to the District's network including their home directories, shared class folders, and multiple computer programs.

The *View* platform has also allowed the District to shift its in-house computer use from full-client desktop computers to zero-client terminals in most instructional areas. Today approximately 2/3 of network computing devices utilize the *View* platform on a daily basis. This has greatly enhanced the network's management, decreased computer downtime, and allowed for more frequent software updates throughout the year while greatly lowering overall computing energy consumption.

The District is currently exploring the possibility of adding a Learning Management Systems (LMS). These software applications are used to administer, document, track, report, and deliver electronic educational technology courses, training programs, or resources. Many colleges use LMS for the delivery of content to both online and hybrid courses. LMS are now being used at the K-12 level to facilitate communication and sharing between students and teachers. An LMS can also serve as a gateway for multiple resources providing students to access to each of these without the need to login to them separately. This is accomplished via single source login. Students, teachers and parents can login to an LMS and have usernames and passwords to third party services such as Google, Castle Learning, or Discovery Education Network stored within their profile.

Community Outreach

Several pieces of software, most of it online, are used for the purposes of parental communication and community relations.

Website

The District has maintained its own website (www.manhasset.k12.ny.us) since 1996 in order to foster communications between the school District and all community members. A Webmaster position was created the same year in order to provide a mechanism for regular posting of information and upkeep of the site. In January of 2015 our domain was changed to www.ManhassetSchools.org . The site has been updated substantially since its inception to allow for the growing reliance on shared information with major overhauls occurring in 2003, 2010 and 2014.

In order to ensure the quality of posted content the Board of Education has adopted and regularly updated a *Website Design and Maintenance Policy* (4526.1). This stressed a new collaborative model of updating the website; it reads in part:

> *The management of the MUFSD website is critical to ensure the timely, high quality and proper posting of information. Website management will be accomplished through the collaborative efforts of the District web master, the Director of Technology, building principals, department coordinators/directors, teachers and support staff.*

In order to ensure that the site fairly represents the professional, educational and high quality standards of our District an accompanying set of *Web Publishing Guidelines* (4526.2 - Appendix D) were also created and have been regularly updated with revisions adopted by the Manhasset Board of Education.

The District website offers a number of features and tools which facilitate both external and internal communication:

Board Policy Manual

Although hard copies can still be obtained they are rarely requested since this key work searchable policy manual went online in 2006.

E-mail Center

Visitors can sign up for or opt out of receiving news on a District, school building or activity level using this simple listserv. To date over 1,000 residents subscribe.

Mobile App

Information posted to the District's website is also available via the "Manhasset Schools" mobile app available via iTunes or the Google Play stores. The app keeps parents, students and staff updated to the latest information including school closings, sports scores, and school events.

Sign-in Area

This password accessible area of the District's website serves as the ideal communications vehicle for the various users of the site – staff, parents and students. Each user group is able to see information relevant to it as well as to customize their landing page to highlight those areas of the website most relevant to them – bookmarking specific teacher pages, creating single sign-in passkeys for online resources such as our *eSchool Data, Parent Portal, and Discovery Education Network* to which the District subscribes.

Teacher Pages

This empowers teachers to quickly and easily communicate more effectively with parents and students by maintaining their own website. No programming knowledge is required.

<u>Parental Notification System</u>

In the fall of 2006 the Manhasset High School implemented the use of NTI's *ConnectEd*, electronic notification system in order to increase communication in three areas: attendance, emergency alerts, and HS community announcements. Due to the great effect with which it was used, *Connect-Ed* was implemented on a district-wide basis in the fall of 2007.

In the fall of 2010 Connect-Ed was acquired by *Blackboard* and is now known as *Blackboard Connect.* This school-to-home communications service sends targeted, recorded messages, by school, by grade or by specific sub-group. Once the phone message is sent, it can reach thousands of homes within minutes, quickly alerting parents and staff to important school information, and saving valuable time in the event of health and safety emergencies. Additionally, use of the system has resulted in thousands of dollars of savings in mailing costs.

<u>Parent Portal</u>

The Manhasset Parent Portal (MPP) is a password protected gateway through which parents/guardians are able to view their child's report cards, progress reports, class schedules and transcripts. They may also use the portal to update contact information such as telephone numbers and email addresses. Beginning with Secondary School students in 2011 paper report cards and progress reports were no longer mailed home unless a written request was made by parents for this purpose. This practice was expanded to upper elementary school students in the 2014-15 school year. As of 2015, all grade levels are using the parent portal.

Staffing

Maintaining, developing and training others to use technology throughout the District requires a number of key support positions.

Director of Technology & Libraries: Responsible for the overall planning of the acquisition, deployments, and maintenance of technology District Wide. Also oversees the development of computer and library curriculum. Plans budgets, meets with vendors, and represents the District as county-wide meetings. Works with administrators and teachers district-wide to develop a vision and budget for the use of technology in all areas. Oversees and evaluates all staff within this department.

Student Information System Specialist: Responsible for the oversight and use of the Student Information System. Works closely with administration to insure proper compilation and filing of student data reports at the local, state, and federal levels. This position also supports end users of the SIS including staff development.

Technology Department Support Staff: Two clerical level support staff work within the Technology Department. These staff members carry out the meticulous data entry and processing of student and family information for the SIS, *eSchool Data,* as well as the inventory system, *Real Asset Manager*. Additionally, they create requisitions, follow up on vendor and service calls and handle some of the IT support calls from end users.

Technology Support Technicians: The District contracts though Nassau BOCES with CSDNET to staff five technicians: a Senior Network Administrator, 2 Senior Technicians and 2 Junior Technicians. Additionally, the District has one Civil Service Audio Visual Technician.

There are 3.4 FTE Computer Teacher Specialists throughout the District who devote a total of 2.4 of their time to student instruction and 1.0 of their time to the Professional Development of staff members. In addition the Student Information Specialist and Director of Technology provide incremental professional development and training as needed. Each of the following computer labs has 1.0 FTE Teaching Assistants who provide assistance to students and staff in the use of computers: Munsey Park Elementary

School computer lab, Shelter Rock Elementary School computer lab, Secondary School Academic Computing Center, World Languages Lab, Writing Center, and Social Studies Lab.

Each of the four School Library Media Centers has a 1.0 FTE Library Media Specialist. Each elementary school library has 0.5 FTE teaching assistant. Librarians work with computer specialists and collaborate with all teaching staff to provide instruction in information literacy and Internet Safety.

E) Curriculum and Instruction

Curricular Goals

Although those born after 1980 have been popularly referred to as *digital immigrants,* a large body of educational research has shown that these students often lack the ability to critically scrutinize information found online. Many students and some staff members are unaware of the risks and responsibilities inherent in today's constantly connected digital landscape. Referred to by many names – new literacies, information literacies, digital literacy, Information and Computer Technology Literacy (ICTL) - these twenty-first century skills are integral to full and effective participation in today's society. As such, they inform an overriding curricular goal – the development of ICTL in all students and staff members.

This goal is partially achieved through the instructional technology curriculum used by computer and library media specialists throughout the district outlined below. As technology is used increasingly across curricular areas the opportunity and responsibility for increasing students digital and information literacies is likewise cross-curricular. As such, standards and white papers on the topic of curriculum and instruction from the International Society for Technology in Education, the Common Core Standards, The Partnership for 21st Century Skills, and the US Department of Educational Technology have been reviewed. There is great resonance across current educational research that information and computer technology literacy is a key skill for the Twenty-first century student. There is also overwhelming agreement on the effectiveness of instilling these skills within the context of core curricula.

Therefore the curricular strategy which is employed is to a three-pronged approach:

- Direct instruction of key ICTL skills through specific computer application and library modules offered across grade levels one through seven;

- The integration of ICTL skills within the context of core curricula by means of ongoing professional development
- Access to all students and staff to meaningful instructional technology resources including hardware and digital content

Computer Application Modules

Within the District's two elementary schools teachers schedule time for classroom lessons in each building's computer lab. A computer teacher specialist, with the assistance of a Teacher Assistant, works with the students and teacher to instruct them in the core ICTL skills. These include navigating a computer network (including the Internet), creating original information using word processing, graphics and presentation software sets, utilizing folders, spreadsheets, and databases to store, organize and analyze information.

Beginning in the fall of 2015 students in second grade received instruction in the concepts of computer programming following course one of the Code.Org curriculum. Based upon the results of this initial pilot, the District will decide on whether/how to further integrated computer programing (aka Coding) concepts into the elementary school computer curriculum.

In the seventh grade, most students participate in a year-long computer applications course following a similar model. Here students revisit earlier skills and build upon them to ensure a greater sophistication of use. Students are also introduced to the use of online tools including Office 365 and Google Apps for Education. A unit of coding concepts is also included using the *Scratch* program developed by the Massachusetts Institute of Technology.

There are now three computer programming coursed offered in the High School: Introduction to Computer Programming I, Introduction to Computer Programming II, and Advanced Placement Computer Programming. These courses are open to students in grades 8 through 12.

As is recommended by the No Child Left Behind Act – Title III, part D – the District strives to insure that all students are technologically literate by the eighth grade. Toward this end, a scope and sequence of core technology skills has been created based upon the National Educational Technology Standards for

Students & Teachers developed by the International Society for Technology in Education (ISTE) and the Nine Information Literacy Standards for Student Learning developed by the American Library Association.

Technology Integration

Computer skills are infused into existing curriculum in much the same way as skills for library and information literacy. A computer teacher specialist collaborates with classroom and subject area teachers on specific projects and schedules time for class visits to District computer labs.

Manhasset also uses a Staff Development Specialists to push technology integration into the classroom. Four staff members have portions of their position devoted to professional development for an overall FTE of 1.0 professional development. This and other methods of staff development are fully discussed in the Professional Development section of this plan.

Special Education and Instructional Technology

The Manhasset School District strives to promote communication and collaboration between the Instructional Technology Department and the Special Education Department to meet the needs of all students with disabilities to ensure equitable access to instruction, materials and assessments. It is noted that one of the five computer technicians is specifically assigned to work with the special education department to facilitate the proper care and maintenance of all such technologies. This provides continuity of knowledge for all SE specific software as well as a timely turnaround time on all issues.

Accommodations for students with disabilities are facilitated by the technology department in a number of ways. These include but are not limited to: assignment of specialized equipment or software, a specific lab set up for the use of the Scholastic *Read 180* reading recovery program, the ability for teachers to post class notes to Manhasset Teacher Webpages and/or MUFSD Google Classrooms, and the facilitation of extended time for testing via a database of student accommodations in a set testing center.

Assistive Technologies

Currently 22.4% of students with disabilities, ages 5-21 years, have Assistive Technology Devices and / or Services designated in their 2015-2016 IEPs. Assistive Technology evaluations are done by consultants. If provided, funding for specialized professional development for teachers and IT staff to make full use of available assistive technologies would be of benefit.

Assistive and adaptive technology evaluations are contracted when a child study team recommends the need for such. The results of each evaluation are sent to the Executive Director of Special Education and the Director of Instructional Technology. The later reviews the recommendations of the evaluation and either the recommended assistive/adaptive technologies or their equivalent are identified as already belonging to the District and assigned to the student or such devices are procured.

F) Professional Development

Recognizing the crucial role which professional development plays in the successful integration of technology the District is committed to funding such opportunities in a variety of ways. This was very clearly demonstrated with the District rollout of SmartBoards to all instructional areas seven years ago. The District is once again following the SAMR model for providing support and training in the use of Google Apps for Educators. The acronym SAMR stands for Substitution, Augmentation, Modification, and Redefinition (Puentedura, 2008) and provides a framework for the adoption of instructional technology by teachers as outlined in the table below.

Substitution	Tech acts as a direct tool substitute, with no functional change
Augmentation	Tech acts as a direct tool substitute, with functional improvement
Modification	Tech allows for significant task redesign
Redefinition	Tech allows for the creation of new tasks, previously inconceivable

As teachers are introduced to Google Apps for Educators they may use Google Docs as a substitute for Microsoft Word. As they become more familiar with the software, they can see that the program saves to the cloud automatically – a functional improvement since the document is now available from any device with internet access. Teachers can begin to modify assignments as they take advantage of Google Docs collaboration features – allowing multiple students to have simultaneous editing access to the same document. Lastly, they may redefine their prior assignments as students are able to work across geographical boundaries and provide real time feedback to students as they complete assignments at home!

Research indicates that effective professional development is the key to integrating the effective use of instructional technology by classroom teachers. Recognizing this fact, the Manhasset UFSD has three Computer Specialist Teachers who devote part of their teaching day to seeing students and part to seeing teachers. Cumulatively, this creates a 1.0 FTE position for Professional Development. In addition the Student Information Specialist and Director of Technology provide incremental professional development and training as needed.

The presence of a staff developer for instructional technology in each building allows for an on-going source of "just-in-time" help available for teachers who are incorporating the use of technology into their curriculum. The Staff Developers works with all personnel - teachers, administrators and support staff. Responsibilities include planning, implementing, coordinating, and conducting staff development programs and activities – independent of and in collaboration with the District's Teacher Resource Center. Additionally, the District utilizes Nassau BOCES *Model Schools* program as well as third party vendors to bring in professional developers for various technology training sessions. Recent examples of such training sessions include *SchoolWires Teacher Pages*, *Google Classroom*, and *Smart Notebook 2014.*
All staff members receive training when current software is upgraded, new technologies are introduced (eg Chromebooks), or remedial assistance is needed in the use of standard software applications e.g. MS Office. Additionally, new staff members receive orientation to all areas of instructional technology at the beginning of and throughout their first two years of being hired as part of the District's *New Teacher Orientation* program. Support staff now receives training through Nassau BOCES *Administrative Office Support* (AOS) which classes on how to efficiently use computerized office tools through a wide variety of training services.

Independent vendors offering professional development services are also contracted as needed. Recent examples include *LogicWing* for Google Docs and Classroom training; *Frontline K12* for training in the AESOP substitute teacher and Veritime time tracking systems; and *TEQ* for Smart Flat Panel training.

Professional development is tracked using *My Learning Plan* (MLP) - a web-based platform for the dissemination and collection of information pertinent to professional development. The product is currently in use and tracks the flow of professional development offerings from the point of course registration or request through its completion. MLP can also be used for post-course surveys to obtain teacher feedback on training sessions. Lastly, MLP is used to ensure that teachers who have earned certification since 2004 meet their required 175 hours of professional development every five years.

G) Smart Schools Bond Act Technology Investment Plan

Anticipated Item or Service Drop Down menu	Estimated Cost	Is Cost one-time or Annual?	Potential Funding Source: (May list more than one source per item.)
Wireless Access Overhaul	$250,000	One time	Smart Schools Bond
Chromebooks in Social Studies classrooms	$100,000	One time	School Operating Budget Manhasset Tower Foundation
Upgrading Interactive Whiteboards – staggered over 3 years	$100,000	Annual (for three years)	Operating Budget Smart Schools Bond
Staffing/Professional Development	$90,000	Annual	Operating Budget
Learning Management System	$35,000	Annual	Operating Budget

H) Status of Technology Initiatives and Community Connectivity

I am happy to report that many of the goals of prior technology plans have been realized. The table below highlights a few such goals as well as those in progress and those that remain.

Goal Area	Goal	Status
Connectivity	Increase Internet Connectivity & Redundancy	Accomplished July 2015
Connectivity	Increase remote access to network resources	Accomplished July 2014 with VMWare upgrade
Connectivity	Address need for access to Internet outside of school hours for those students without an ISP*	Partially Met – 2 identified students have been assigned mobile hotspots
Infrastructure	Harden the security shell of all buildings.	Partially Met – All buildings have multiple IP cameras, access control, and emergency lockout stations.
Infrastructure	Increase the presence and density of wireless network connectivity	**Unmet**
Classroom Technology	Provide and maintain appropriate large display technologies in all classrooms	Met- July 2012 – each instructional space has a SmartBoard, Flat Panel, or Interactive projector. Replacements made as needed.
Classroom Technology	Increase mobile technology district wide.	Partially Met 400 Chromebooks have been added district-wide to classrooms this year (2015)

Professional Development	Increase the professional developer to 1.0 FTE	Accomplished Sept, 2015
Professional Development	Increase instructional technology professional development opportunities for teaching staff	Partially met – three days of IT PD have taken place this year (2015-16); three more are planned.
*The following public points of internet access have been identified and are listed on the Technology website: • Barnes & Noble Booksellers, 1542 Northern Boulevard. Open from 9:00 AM to 11:00 PM Mon – Sat and 9:00 AM to 9:00 PM Sun. • Dunkin Donuts 370 Plandome Road. Open 5:00 AM to 9:00 PM daily. • Manhasset Public Library – 30 Onderdonk Ave. Open 9:00 AM to 9:00 PM Monday, Wednesday, Thursday and Friday; 11:00 AM to 9:00 PM on Tuesday; 9:00 AM to 5:00 PM on Saturday and 12:00 PM to 5:00 PM on Sunday. • Manhasset/Great Economic Opportunity Council. Open Monday – Friday from 8:00 AM to 6:00 PM. • Starbucks 375 Plandome Road. Open 6:30 AM to 9:30 PM daily		

Areas of Development to Reach Goals

There are three areas that will need further development in order to reach the stated goals. These include an overhaul of the Districts current wireless network infrastructure; ongoing outreach to those without home Internet access; and security updates.

With a new wireless standard soon to be adopted, our challenge will be in providing all users robust wireless access to the network. Purchase of new access points would greatly facilitate this goal. Our challenge is: funding for a forklift upgrade of our existing wireless network to Aps that meet the new standard. The later of these two items is marked as our primary expenditure of the $432,581 allocated to Manhasset as our Smart Schools Bond Act funds.

The second gap is in Internet connectivity. The number of families moving into the District who do not have broadband connectivity to the Internet is growing. As this number increases, our challenge will be finding a means for all of these families to connect to the District's computer resources after school. The District attempts to identify students who may not have internet access at home through parental surveys as well as discrete conversations. We have provided such students with wifi hotspots with monthly service plans as needed. The Director of Technology has also attended meetings with other Directors of Technology and local Internet Service Providers to investigate further ways to provide internet access as needed. Additionally, state and federal resources are continuously being investigated.

Thirdly, the District has been increasing building security on a number of fronts for years. Sadly, this is a task that is never fully complete as incidents from around the country tragically remind us. Currently, Internet Protocol cameras are mounted throughout all three buildings as well as in key locations outside of each building. Video recording hardware and software were upgraded significantly in the fall of 2013. Cameras have also been added in key locations and to replaced failing older cameras since that time. In the fall of 2015 we entered Phase III of this security upgrade. Emergency lockdown pull stations (similar to fire pull stations) have been mounted in key locations throughout each building. These stations will be tied into the security software so that, in the event of a lockdown, the building PA system will play a pre-recorded announcement indicating that the building is now in lockdown. Simultaneously, all door access readers will stop allowing access via HID cards. Additionally, a previously scripted emergency text message will be sent to staff and parents announcing the lockdown. Strobe lights, mounted on the exterior of each building will begin flashing to warn any person approaching the building that it is in lockdown and they should not approach the building. Lastly (though simultaneously), emergency services will be notified that the building is in lockdown.

I) Instructional Technology Plan Implementation

The following table lays out the dates, actions and desired outcomes for how the Manhasset Union Free School District will implement this plan.

Dates	Actions	Desired Outcomes
Summer 2015	Hire 0.6 FTE Professional Developer for Secondary School; Increase TA support in each elementary school computer lab – allowing computer specialists to devote .25 of their time to professional development.	Increase the amount of instructional technology professional development to all staff for the 2015-16 school year.
Summer 2015	Procure 360 Chromebooks with support of the Manhasset Tower Foundation. Register with Google Classroom. Place class sets of Chromebooks in all Secondary School ELA classrooms.	Increase student and teacher access to mobile computing devices within school (Chromebooks) on a platform that will also be effectively reached outside of school (Google Classroom)
2015-16	Professional Development training for ELA and Social Studies departments in use of Google Classroom and Chromebooks	Increase teacher comfort level and proficiency with new technology and platform; increase overall level of digital literacy
2015-16	Investigate various learning management systems through	Position District for pilot of a specific LMS for fall of 2016

	participation in Nassau BOCES LMS program and independent research.	
Dates	**Actions**	**Desired Outcomes**
2015-16	Phase III of security upgrade. Installation of lockdown pull stations, exterior strobe lights, software tie in to PA system, emergency text messaging and computer network to announce lockout	Increase overall level of District security
2015-16	Training in use of lockdown software for key staff including building admins and security guards.	Insure that al staff and students are prepared and able to respond to emergency events.
Summer 2016	Installation of upgraded wireless access points in all instructional locations	Increase range and density of wireless connectivity for all students and teachers to allow for greater computing mobility
Summer 2016	Procure 360 Chromebooks with support of Manhasset Tower Foundation. Register all with Google Classroom. Place class sets in sixth grade classrooms and special education areas.	Increase student and teacher access to mobile computing devices within school on a platform that can be effectively reached outside of school
2016-17	Professional development training for staff members having received Chromebooks and Google Classroom accounts.	Increase teacher comfort level and proficiency with new technology and platform; increase overall level of digital literacy
2016-17	Provide training in use of selected LMS; collect regular feedback from teachers and students	Determine if selected LMS can be scaled to a larger portion of District in 2017-18
Spring 2017	Select LMS for deployment in 2017-18	Increase student and teacher access to instructional materials; provide students and teachers with effective means of communication and collaboration
Fall 2017	Professional development in use of selected LMS	Increase student and teacher access to instructional materials; provide students and teachers with effective means of communication and collaboration
2015 – 2018	Replacement of failing SmartBoards with Interactive Flat Panel devices	Provide for improved classroom display and use of information by teachers and students

J) Monitoring and Evaluation

Monitoring & evaluation of the implementation of the technology plan will take place throughout the year using a number of metrics. These are indicated by area below.

Increasing Digital Literacy

Teachers currently submit work orders for any technology help through a web-based system that allows us to track issues and monitor turn-around time. It has been noticed over the years that a technology work order reporting the malfunction of equipment or software often reveals the need for additional training in the use of said hardware or software.

With the hiring of a 0.6 FTE Professional Developer for the 2015 – 16 school year, we will now be able to utilize the Tech Help system as a tool for identifying those staff who need to increase their digital literacy as well as to monitor how many teachers the Professional Developer is seeing. This system will allow us to track response time from when a PD issue is identified to when assistance is offered. We will also be able to utilize the "client feedback" as a measure of staff satisfaction with assistance.

Another tool that will be used for monitoring and assessing the effectiveness of professional development offerings is My Learning Plan - our PD tracking software. Professional development offerings that focus on instructional technology will require the completion of a class evaluation by all participants. Responses will be reviewed and shared in the aggregate with professional developers (both internal and external).

Increase access to mobile computing devices

In keeping with our plan, we will look at access to technology as including both access to physical hardware and the ability to use said hardware well. In order to monitor and evaluate this goal - student and staff usage surveys will be conducted at the beginning and end of the school year to compare baseline usage with year-end usage. Survey Monkey will be used to collect information on both frequency of use and comfort level and proficiency when using mobile technologies.

Further develop wireless infrastructure

Basecamp project management software will be utilized to track the progress of the ongoing improvement of our wireless infrastructure. Wifi management software will be used to measure usage and throughput.

This data, in combination with feedback gathered through the Tech Help work order system, will help to identify how well we are keeping up with providing the necessary Wi-Fi density to deliver throughput to meet end users demands.

Investigate and select an effective Learning Management System

Once again Basecamp project management software will be used to track the goals of investigation, piloting, and acquisition of a learning management system by the Fall of 2017. Basecamp allows key stakeholders to be kept informed about developments in the project.

Continue to provide access to relevant developing technologies

Membership and participation in the Nassau BOCES NASTECH service will allow the Director of Technology to keep abreast of technology innovations being used locally while attendance by IT staff at State and national technology conferences (NYSCATE & ISTE) will serve the purpose of monitoring developments in instructional technology.