Buffalo Public Schools
Smart Schools Investment Plan

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Smart Schools Bond – Overview

The Smart Schools Bond Act (SSBA) was passed in November 2014 by statewide referendum which authorized the issuance of $2 billion of general obligation bonds for the purpose of improving educational technology and infrastructure improvements. **The Buffalo School District (BPS) has been allocated $56,020,356.** These funds will be paid to the District by New York State as **reimbursement** for technology expenses under the plan. SSBA stipulates that funding is allocated for four main areas:

- Install high-speed broadband or wireless internet connectivity for schools and communities
- Acquire learning technology equipment
- Install high-tech security features in school buildings
- Construct, enhance, and modernize educational facilities to accommodate pre-kindergarten programs and to provide instructional space to replace classroom trailers.

Over the course of the past year, a plan was developed with laser-like focus to provide technological opportunities for our students. The proposed plan was developed by a cross-section of District stakeholders including teachers, administrators, community members, academics, and parents. For more information about the SBBA, please refer to http://www.p12.nysed.gov/mgtserv/smart_schools/.

Reshaping Technology – Reshaping Our Schools

The Smart Schools funds will enable the Buffalo Public Schools to jump start the implementation of their Buffalo Public Schools' *Three Year Strategic Technology Plan 2016-2019*. The Technology Plan is available at http://buffaloschools.org/informationtech.cfm. This plan outlines goals and objectives in support of the District's *New Education Bargain*. Further, this Smart Schools Investment Plan (SSIP) directly aligns with the 2016 – 2019 BPS Technology Plan in support of the New Education Bargain.

BPS teachers will use cutting edge 21st Century tools to engage students in the classroom. Students will employ mobile computing devices throughout the day to support personalized learning and differentiated assignments. This will enable teachers to best meet the needs of all learners, including those with Special Education students and the increasing population of English Language Learners (ELL).

Schools, more than ever, will need to continuously reinvest in their technology infrastructure to keep pace and provide students with state of the art resources. The BPS SSIP will make these necessary investments into the technical and digital infrastructure providing secure, ubiquitous, on-demand, high-speed access for Buffalo's students and teachers.

The community Wi-Fi component will provide high-speed internet access from home to strengthen the home-school connection for homework, flipped classroom activities, and parent communication as well as providing a digital learning environment for homebound students.
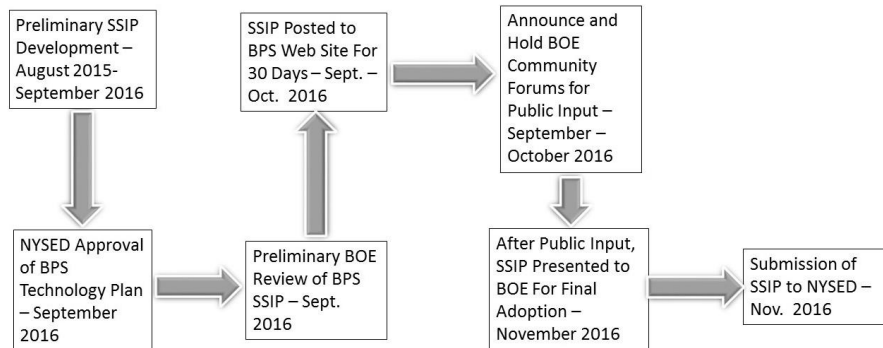
Finally, this funding will assist with the support of BPS's innovative high school programs and will add new and emerging technologies for STEAM and other programs to prepare BPS students for the global workforce and higher education.

Smart School Planning Phases

The following diagram shows the phases to the SSIP process.

SSIP Process and Timeline For Submission to NYSED

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Preliminary SSIP          SSIP Posted to          Announce and
Development –             BPS Web Site For        Hold BOE
August 2015-              30 Days – Sept. –       Community
September 2016            Oct.  2016              Forums for
                                                  Public Input –
                                                  September –
                                                  October 2016

NYSED Approval            Preliminary BOE         After Public Input,
of BPS                    Review of BPS           SSIP Presented to      Submission of
Technology Plan           SSIP – Sept.            BOE For Final          SSIP to NYSED –
– September               2016                    Adoption –             Nov.  2016
2016                                              November 2016
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DISTRICT-WIDE PARTICIPATION

The Buffalo Public Schools SSIP was developed largely through contributions from teachers, district staff, higher education, and community members in the planning process for the BPS proposed Smart Schools Investment Plan. In addition to the following, the District released a survey to the schools participating in the New York State Learning Technology Grant to inquire about priorities for district improvement. The survey was distributed at the end of the 2015-16 school year and had 246 responses.
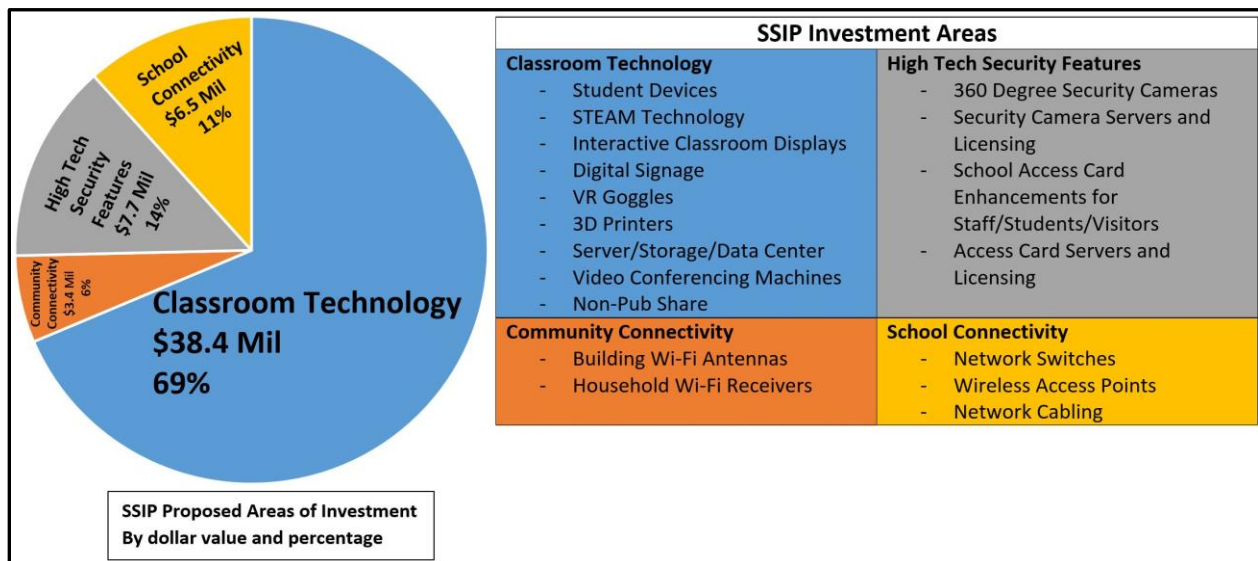
- Eric Stockmeyer, Project Administrator, Information Technology Department (district contact for SSIP)
- Kelly Baudo, Director of Science
- Jamie Belz, Teacher
- Margaret Boorady, Associate Superintendent of School Leadership
- Anne Botticelli, Chief Academic Officer
- Sabatino Cimato, Associate Superintendent of School Leadership
- Giovanna Claudio-Cotto, Teacher
- Mary Jo Conrad, Associate Superintendent of School Leadership
- Janique Curry, Erie County Medical Center
- Heather DiGiacomo, Instructional Technology Coach
- Kevin Eberle, Chief Operations Officer
- Sarah Edwards, Supervisor of Instructional Technology
- Sanjay Gilani, Chief Technology Officer
- Joseph P. Giusiana, Executive Director of Plant Operations
- Annmarie Lehner, Information Technology Officer, Rochester City Schools
- David Mauricio Ed.D., Chief of Alignment & Innovation
- Fatima Morrell Ed.D., Assistant Superintendent of Curriculum, Assessment, and Instruction
- Geoffrey Pritchard, Chief Financial Officer
- Eric Rosser Ed.D., Associate Superintendent for Student Support Services
- William Russo, Director of Instructional Technology
- David Rust, Say Yes to Education
- James Weimer, Associate Superintendent of School Leadership
- Casandra Wright, Associate Superintendent of School Leadership
- Joseph Zawicki, Ph.D., Buffalo State College

Proposed SSIP Investment Areas

The following bullets and accompanying diagram show the proposed investment areas for the BPS Smart Schools Investment Plan.

- **Classroom Technology** – Technology can be a powerful vehicle for actively engaging all students in learning; that active engagement is particularly important for students who are struggling, students who crave acceleration, and those who may need extended or alternative learning. Additional student computing devices and innovative technology will be acquired so teachers are able to personalize learning and differentiate both the content and the pedagogical approaches tailored to the needs each child.
- **Community Connectivity** – Many students in the District do not have at-home access to the internet. SBBA funds will be used to invest in the components necessary to expand Wi-Fi coverage into neighborhoods. Increasing student access outside of school can extend learning beyond the hours of the day and the confines of the classroom.
- **High Tech Security Features** – An upgrade to the District's security systems will enhance student safety in school buildings. Swipe card entry for all students and staff will provide detail regarding who is present in a school building. In addition, updated camera technology will enhance security and student safety by providing centralized access to security footage.
- **School Connectivity** – Upgrades to school building IT infrastructure will ensure that all teachers and students have network and internet access when they need it. In order to meet usage demands with the appropriate level of network and internet access, network switches will be upgraded to allow for higher throughput and every classroom will have at least one wireless access point to increase internet capacity in instructional spaces.

SSIP Investment Areas	
Classroom Technology - Student Devices - STEAM Technology - Interactive Classroom Displays - Digital Signage - VR Goggles - 3D Printers - Server/Storage/Data Center - Video Conferencing Machines - Non-Pub Share	**High Tech Security Features** - 360 Degree Security Cameras - Security Camera Servers and Licensing - School Access Card Enhancements for Staff/Students/Visitors - Access Card Servers and Licensing
Community Connectivity - Building Wi-Fi Antennas - Household Wi-Fi Receivers	**School Connectivity** - Network Switches - Wireless Access Points - Network Cabling

Pie chart — SSIP Proposed Areas of Investment By dollar value and percentage:
- Classroom Technology $38.4 Mil 69%
- School Connectivity $6.5 Mil 11%
- High Tech Security Features $7.7 Mil 14%
- Community Connectivity $3.4 Mil 6%

CLASSROOM TECHNOLOGY

NEEDS STATEMENT

Over the years, Buffalo Public Schools has introduced a number of innovative District-wide and classroom/program specific technologies. With grant programs focused on professional development, these "technology in the classroom" options have met with increasing success. However, in a large district, it is difficult to fully meet the needs of all classrooms while simultaneously refreshing existing equipment. While there are iPads, laptops, and tablet-based computers in all schools, most are shared among several classrooms, resulting in students having prescribed or predetermined times for using them.

SOLUTION

Technology can be a powerful vehicle for actively engaging all students in learning, and that active engagement is particularly important for students who are struggling, students who crave acceleration, and those who may need extended or alternative learning. The SSBA will enable BPS to provide additional student computing devices and innovative technology so teachers can personalize learning and differentiate both the content and the pedagogical approaches tailored to the needs each child. Instead of sharing laptop carts among several classrooms, there will be adequate devices for all students. Based on the District's successful experiences with its NYS Learning Technology Grant (LTG) programs, BPS anticipates that this will engender and empower students with critical skills such as (among others) critical thinking, collaboration, self-direction, and creativity to prepare students for higher education and a competitive global 21st Century workforce.

SPENDING PLAN

BPS proposes allocating funding to provide personal computing devices for all students, instructional resources, classroom technology, and an upgraded data center.

CLASSROOM TECHNOLOGY

Goal: All students will use technology as part of daily instruction, including:

-- Classroom technology refresh

-- Classroom Visual Display Systems

--Increased access from classrooms to LAN/WAN data

-- STEM programming

Cost: $38.4 Mil. – 69%

Timeline:
- 2016-19 – Provide student devices for all students in Gr 3-12 and classroom sets for K-2
- 2016-2019 – Develop technology-rich curriculum at all levels
- 2016-2019 – Install audio-visual tools in all classrooms
- 2016-2019 – Design and implement innovative programs at all high schools

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COMMUNITY CONNECTIVITY

NEEDS STATEMENT

Many students in the District do not have at-home access to the internet. Data shows that specific segments of the population – specifically low-income and immigrants, are not experiencing the educational benefits and opportunities that technology and the internet offers. SBBA funds will be used to invest in the infrastructure necessary to expand Wi-Fi/Broadband coverage into neighborhoods.

SOLUTION

There are several viable options for providing home internet access for students.

- A subscription to cable or satellite service for home use would provide connectivity for all households and would be renewable on an annual basis.
- A TV "White Space" Wireless network takes advantage of the unlicensed wireless spectrum of between 470 MHz to 790 MHz and consists of a network of antennae, which would be installed on school buildings and receivers in BPS households.
- A set of Mi-Fi devices could be used to create "hot-spots" for students who do not otherwise have access.
- Extending the District Wireless network from certain schools to surrounding neighborhoods.
- Extending the District connectivity through the use of adding a fiber optic extension from certain schools to densely populated areas.

With this variety of options, the first step will be to conduct a feasibility study, reviewing all options, estimating cost, and exploring the pros and cons of each solution. Following this, an RFI will be issued to gain insights from vendors, and a direction and selection will be made, based on based on a rubric that will be developed during the exploration phase.

SPENDING PLAN

BPS proposes allocating funding to provide Wi-Fi access for students throughout the BPS area. The total cost includes the feasibility study, procurement, installation, and training.

Recommendation: Explore the opportunities to have the Schools and Libraries Division of the Universal Service Access Corporation to have the E-rate program help subsidize any annual costs for community connectivity.

HOME ACCESS FOR ALL STUDENTS

Goals: Increase home connection opportunities for all students.

Increase parent connections.

Cost: $3.4 Mil – 6%

Timeline:
- 2016-17 – Feasibility study and RFI
- 2017-2019 – Vendor Selection and Deployment

HIGH TECH SECURITY FEATURES

NEEDS STATEMENT

An upgrade to the District's security systems will enhance student and staff safety in school buildings. The existing systems have limited functionality compared to the newer systems that are currently available. In the case of video surveillance, for example, the DVRs in the current system are no longer supported by the vendor. They have aged considerably and the District is at risk for failure. The currently installed pan-tilt-zoom (PTZ) cameras are aging and breaking and the other cameras are also aging and at or approaching the end of support.

SOLUTION

Since the existing access control and video surveillance systems were installed almost 10 years ago, technology has changed and there is more functionality that can integrate these with the district's data systems. RFID technology has changed in which the range of transmitting and receiving has expanded. This technology could be utilized in conjunction with staff time and attendance, student attendance, onboarding visitors, and most importantly, a quick count of egress and a reporting of who may remain in a building in the event of an emergency.

An updated video surveillance system will enhance security and student/staff safety by providing centralized access to security footage. In addition, the updated camera technology will provide better coverage and also reduce the number of cameras needed.

SPENDING PLAN

BPS proposes allocating funding to provide new video surveillance systems and new access control systems at all schools. The video systems will include up to 5000 cameras, with centralized servers and software licenses. The access control project involves replacing and adding security for up to 1440 doors.

UPDATED BUILDING MANAGEMENT SYSTEM

Goals: Implement a building management solution to include upgraded video surveillance, enhanced card access, and perimeter access security enhancements.

Cost: $7.7 Mil. – 14%

Timeline:
- 2016-17 – Feasibility study and RFI
- 2017-2019 – Vendor Selection and Deployment

SCHOOL CONNECTIVITY

NEEDS STATEMENT

The existing network switches are out of warranty. To meet usage demands with the appropriate level of network and internet access, network switches will be upgraded to allow for higher throughput and every classroom will have at least one wireless access point to increase internet capacity in instructional spaces.

SOLUTION

A high level of connectivity is critical to support the number of devices and types of activity that a BYOD or 1:1 program requires. In the current landscape of VMware and shared laptop carts, the demand on the wireless network has not exceeded its capacity. However, building on the success of recent digital instruction initiatives. The proposed improvements to the school networks will increase the capacity of the cable from Category 5e to Category 6a.

An organization's data network is the backbone and lifeblood of its operational infrastructure. Without robust network capacity (wired and wireless) complete with the requisite components, the organization cannot support the myriad initiatives that it may be faced with. For a complex educational institution such as the Buffalo Public Schools, this means the network must have the agility and capacity to support the increasing demands of educational programs, 1:1 initiatives, building control systems, security cameras, VOIP telecommunications, video conferencing, cloud software and a host of other applications that call for more data.

Physical classrooms and classroom display technologies are changing as well. More emphasis is being placed on audio and video as well as interconnectedness. Chalkboards gave way to dry erase boards which, in turn gave way to interactive whiteboards. Interactive whiteboards, while still very viable, are now being replaced by interactive LED displays.

The increased cable capacity is intended to support a minimum of one device per student (several 1:1 districts report the actual load as 3:1). In addition, SBBA funds will provide upgraded switches, audio-visual classroom tools, and data center expansion.

SPENDING PLAN

BPS proposes allocating funding to update networks within the schools with state-of-the-art switches, higher-capacity cabling, and additional wireless access points throughout. This will enable the network to handle the significantly increased demand as individual student devices are rolled out in all schools. It is anticipated that the demand will increase by triple up to tenfold based on the number of existing devices within each school.

SCHOOL CONNECTIVITY

Goals: Upgrade wireless access within schools.

Increase bandwidth within schools and across district.

Cost: $6.5 Mil – 11%

Timeline:
- 2016-17 – Review strategic options and develop RFP
- 2017-2019 – Vendor Selection and Deployment

Professional Development Plan

The Buffalo Public Schools have a longstanding commitment to using technology to allow students to show what they have learned in multiple ways, thereby offering a more accurate assessment of their growth. As the district has introduced classroom technologies, including interactive whiteboards, student devices, and student response systems, BPS has offered professional development in a variety of formats to meet the diverse needs and preferences of teachers. These include face to face workshops, online courses, release day training, summer boot camps, and subscriptions to just-in-time-learning. More recently, with the introduction of classroom sets of iPads and tablets, BPS has launched an embedded professional development model in the priority schools. Instructional technology coaches (ITCs) work with classroom teachers and ESL teachers to develop and deliver technology-rich instructional units. The focus of this PD is to place the ELL student in the role of content creator, not just a consumer of material. Learning applications such as Comic Life or iMovie provide a mechanism for students to use multimedia to express understanding of topics. For novice technology-users, partnering with the ITCs allows them to build confidence in their new skills and explore a new pedagogical approach integrating technology with content. Early results of this model show that students are more engaged and the quality of their work improves significantly, and that teachers are inspired to apply this model to other units. With the SBBA funds, BPS will be able to introduce this model to additional schools.

Monitoring and Evaluation Plan

Throughout the implementation the Smart Schools Investment Plan, BPS will monitor the status of the project initiatives and evaluate their impact on the BPS community.

MONITORING PLAN

The SSIP Monitoring Plan includes managing a project plan for each major project with strategies such as:

- Online project plan
- Periodic calls as needed between project managers and vendors
- Real time status reports
- Regularly scheduled project plan review to determine whether adjustments are needed.

EVALUATION PLAN

Over the past three years, BPS has been refining its evaluation plan for many of its newer technology initiatives including the NYS Learning Technologies Grant (LTG) to assess the effectiveness of the LTG project on participating classrooms. The evaluation includes school visits, pre- and post- survey, testimonials of participants, and a review of student artifacts. In addition, the district is tracking the trends across a wide range of educational areas in the participating schools. The evaluation may focus on these and other anticipated outcomes of the Smart Schools Investment Plan:

- The impact of providing additional classroom technology throughout the district on personalized earning and differentiation.
- The impact of increased Wi-Fi coverage in neighborhoods on increased student participation and parent connections.
- The extent to which an upgrade to the District's security systems enhances student safety in school buildings.
- The extent to which the upgrades to school building IT infrastructure meet usage demands to ensure that all teachers and students have network and internet access when they need it.

Sustainability Plan

Each year, Buffalo allocates a portion of its technology budget for the repair and the replacement of aging equipment. The equipment purchased through the Smart Schools Bond will be spread out over several years. As this equipment ages, it will be worked into the District's refresh/replacement schedule. BPS will continue to invest district funds towards technology and professional development as it has done so in the past.