Niskayuna Central School District
Smart Schools Investment Plan
Phase 2 - Network Upgrade

August 2018
Edward F. Alston III
Coordinator of Information Technology

Smart Schools Overview

The SMART SCHOOLS BOND ACT OF 2014 was passed in the 2014-15 Enacted Budget and approved by the voters in a statewide referendum held during the 2014 General Election on Tuesday, November 4, 2014. The Smart Schools Bond Act authorized the issuance of $2 billion of general obligation bonds to finance improved educational technology and infrastructure to improve learning and opportunity for students throughout the State.

Initial Niskayuna CSD Allocation	$1,494,855
Phase 1 (School Security, approved November 2017)	$488,000
Phase 2 (District-wide Network Upgrade, estimated)	**$741,693**
Phase 2 (anticipated E-Rate reimbursement, estimated)	**$(217,347)**
Phase 3 (Elementary Network Cabling, estimated)	$125,000
Remaining Funds (estimated)	$357,509

Plan Development

Spring 2015	Engaged with technology consultant to identify priorities.
Summer 2015	Extensive data collection to inform decision making.
Fall 2015	Initial network design and budget quotes.
Summer 2015-Spring 2018	Implementation of Phase 1. (School Security - Video Surveillance)
Summer 2017	District Technology Committee reconvenes.
Fall 2017	Clarity survey shared with parents, students, and staff. Identification of district instructional technology goals.
Winter 2017	Revised network design and final quotes.

Goals for Phase 2

- **Support instructional technology goals**, as identified by the District Technology Committee.

- Focus on **long-term (10 year+) investments**, which are difficult to fund in the annual budget.

- Upgrade wide area network to **support 10Gps connections** between all school buildings.

- Accommodate **additional student devices** at all levels, including the planned 1:1 initiative.

- Add redundancy to critical network infrastructure to **improve network reliability** for all users.

- **Improve network security** to ensure critical systems and sensitive data stay protected.

- **Reduce annual maintenance costs** and streamline IT department operations.

- Increase **energy efficiency** at all schools.

- Reserve funding for a **planned generator** to support the district datacenter. (Phase 4)

Project Scope

- Replace critical centralized equipment and add redundancy (core switch, WLC)

- New "edge" switch at each building, with 10Gbps connection to WAN

- New switches in each network closet, with redundant 10Gbps connections (Most recently purchased switches at HS repurposed, but all others removed and/or replaced.)

- Replacement wireless access points at elementary and middle schools (HS already completed)

- Standardized battery backups, district wide, for all network devices. (minimum 2 hour runtime)

- Update to latest Cisco network management software

School Network Upgrades

Current Design

- 27 Network Closets
- 138 Switches
- 100Mbps-1Gbps end user connections
- Separate switches for data, voice, wireless, and security connections
- 1-2Gbps uplinks for each switch
- Battery backup for voice switches only
- Focus on wired connections for users
- 304 WAPs, in hallways at ES, older devices at ES, MS

Proposed Design

- 27 Network Closets
- **57** Switches
- **1Gbps** end user connections
- **All** switches capable of serving data, voice, wireless, and security connections
- Shared **20Gbps** uplinks for each closet
- Battery backup for **all** switches
- Focus on **wireless** connections for users
- **422 802.11ac** WAPs, in **all classrooms**

Central Network Upgrades

- Redundant Wireless LAN Controllers

- Redundant Network Core, simplified design

- Fiber connections to support 10Gbps wide area network

- Software upgrades to improve security

- Standardized and flexible configurations for all network equipment

Cost Summary

All expenses fall into the School Connectivity (4a) category for Smart Schools. Total cost for Phase 2 is **$741,692.43.**

Elementary Schools

$327,044.93

Network Hardware	$235,743.20
Battery Backup	$52,527.72
Software	$16,398.30
Implementation	$22,375.71

High School

$122,569.62

Network Hardware	$70,173.12
Battery Backup	$29,176.13
Software	$10,962.85
Implementation	$12,257.53

Middle Schools

$147,265.80

Network Hardware	$147,265.80
Battery Backup	$20,564.42.
Software	$11,315.25
Implementation	$15,980.85

Central Network Upgrades

$96,951.56

Network Hardware	$73,027.24
Battery Backup	$0.00
Software	$18,270.60
Implementation	$5,653.72

Ongoing Support

The district currently contracts with NERIC to provide Cisco SmartNet maintenance on critical network components. After project completion, costs are estimated to be **$22,000 per year**, a significant savings compared to recent years.

The current district network is supported by a wide variety of aging network components, operating on different software versions, and with inconsistent configurations. This project will allow us to move to a standardized set of devices with templated configurations. In conjunction with new tools for centralized management, this will enable the IT Department to more efficiently support the network and all users who rely on it.

School Connectivity Requirements

The Smart Schools Bond Act requires school districts meet minimum connectivity levels, as identified by the Federal Communications Commision in the E-Rate Modernization order of 2014.

	Number of Students	Multiply by 100 Kbps	Divide by 1000 to Convert to Required Speed in Mb	Current Speed in Mb	Expected Speed to be Attained Within 12 Months	Expected Date When Required Speed Will be Met
Calculated Speed	4,247	424,700	424.7	480	480	N/A

E-Rate

Additional federal funds are available for many items included in this plan, through the E-Rate Category 2 program, administered by USAC. Niskayuna CSD is entitled to a 40% discount on eligible items.

Smart Schools - Phase 2 Total	$741,692.43
E-Rate - Eligible Expenses	$546,594.56
E-Rate - Discount	$(217,346.85)
Smart Schools - Phase 2 Net	**$524,345.58**

Questions or Comments

Public comment period is open for 30 days. Please send any questions or comments to:

publiccomment@niskyschools.org