

Onondaga Central School District Comprehensive Technology Planning (CTP) Executive Summary

June 21, 2016

Presented to Onondaga Central School District Board of Education



CTP Overview



Current: Technology Conditions Survey (TCS) Results



Future: Onondaga CSD Goals and Objectives



Roadmap: The Comprehensive Technology Plan (CTP)



OCSD SSIP: Smart School Investment Plan (SSIP) Overview



Schedule: SSIP Timeline



Discussion: Questions and Comments





Current State: Technology Conditions Survey (TCS) Results



The Technology Conditions Survey



Archi-Technology LLC's Role

- **Independent Technology Consultants** with more than 20 years experience with technology infrastructure in educational settings.
- Conducted objective **Technology Conditions Surveys (TCSs)** on all district buildings.
- Assisting the District with the **development and administration of the SSIP** and other related technology plans.
- Help **maximize the various funding sources** available to cost-effectively meet the District's five-year technology goals.

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The Technology Conditions Survey



- **Technology Conditions Surveys (TCS)** form an objective foundation of information about the state of OCSD's current technology infrastructure and select IP-connected systems.
- All **(7) district buildings** have been surveyed.
- Emphasis placed on **technology infrastructure** (Cabling and Pathways) and **Telecommunications Rooms (TRs)** although other IP-connected systems also surveyed.
- The **final TCS Report** with findings, recommendations, and Rough Order of Magnitude (ROM) budgets delivered to district June 15.

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TCS Report: Sample Pages



Conditions & Recommendations

Archi-Technology LLC
Presented to King + King Architects

Onondaga Central School District
Technology Conditions Survey Report

1. Existing Technology Conditions

ROCKWELL ELEMENTARY SCHOOL

1.1. Telecommunications Infrastructure

1.1.1 Horizontal Cabling

Cable Installation

- Cabling is a blend of CAT5, CAT5e and CAT6 cables. Horizontal cabling is terminated on patch panels in the CERs. Occurrences of crimp-on connectors used to terminate the cables at the workstation end were observed. 8-port hubs are deployed to provide sufficient data ports for devices in some classrooms and offices.
- Cables are installed in surface-mount raceways and through accessible ceilings. Cables are not supported to industry standards. Cables were tie wrapped to conduits, threaded rod, and other building and systems-support hardware.
- There is sufficient cabling in the classrooms and offices.
- The CAT5e and CAT6 cabling installed for the WLAN to the wireless access points is adequate to provide the bandwidth necessary. However the installation methods and practices could degrade the performance of the cable.
- There were no cable test results or record drawings of the existing technology infrastructure available.


1.2 Backbone Cabling

Intra-Building Backbone Fiber


- Existing backbone cabling consists of a 6-strand MM fiber optic cable installed from the building's MDF to each IDF.
- The existing fiber-optic cabling is neither armored nor protected by innerduct.

Backbone Fiber Redundancy

No redundancy is present for the Intra-building or Inter-building fiber optic backbone cabling.



Rockwell IDF (10) unsupported horizontal cable in unsecured space.



Rockwell Fiber Optic backbone exposed to accidental or intentional damage.

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TCS Survey Pages

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Onondaga Central School District
Technology Conditions Survey Report

Junior/Senior High School TCS Sheets

Mark: E = EXCELLENT S = Satisfactory U = Unsatisfactory

1. TELECOMMUNICATIONS INFRASTRUCTURE

1.1. Horizontal Cabling

Item	Minimum Requirement to Pass	Mark	Comments
Horizontal UTP Cabling	Labeled and tested to CAT5e specifications. Cable is installed in one of the following raceway systems: Cable Tray, J-Hooks, Conduit, or Surface Raceway. NOTE: Fireable walls are acceptable where fire code allows.	U	
Cable Counts	4 cables per classroom (2 in front, 2 in rear), 2 cables per office station	U	8 port switches are deployed in classrooms and offices to provide additional ports for devices.
Serving Zones	Serving zones are identified and documented to dictate the coverage area of a Communications Equipment Room (CER).	U	
Wireless Access Point (WAP) Cabling	Each WAP is connected to the network with a CAT5E cable that has been labeled and tested.	S	

1.2. Backbone Cabling

Item	Minimum Requirement to Pass	Mark	Comments
Intra-building Backbone Fiber	At least 6 strands of Single Mode fiber installed between primary CER and all secondary CERs.	U	62.5 MM fiber between all CERs
Inter-building Backbone Fiber (Campus)	At least 6 strands of Single Mode fiber installed between primary building and all secondary buildings.	U	62.5 MM fiber between buildings
Backbone Fiber Redundancy	Every logical fiber route has a redundant connection.	U	No physical or logical redundancy
Backbone Fiber Installation	All fiber is in an armored sheath or contained within a conduit or innerduct. Installation route is documented.	U	Fiber is unprotected.
Service Provider Fiber Installation	All fiber is in an armored sheath or contained within a conduit or innerduct. Installation route is documented.	U	Fiber is protected, routes are not documented.

1.3. Communication Pathways

Item	Minimum Requirement to Pass	Mark	Comments
Cable Tray	Cable tray is installed per NEC / manufacturers guidelines. Cabling is supported properly and a fill ratio of 80% is not exceeded.	NA	No primary pathways were observed.
J-Hooks	J-Hooks are installed at a maximum of 48" apart and attached per NEC / manufacturers guidelines. J-Hooks have bend radius protection to ensure a minimum bend of 2".	U	If present, spacing exceeded recommendations. J-Hooks were observed. Cabling supported by building structural supports, or attached to conduits or pipes.
Conduit	Conduit is installed per NEC guidelines. A fill ratio of 40% is not exceeded.	U	If present, conduits were at or exceeded capacity.
Surface Raceway	Surface Raceway is installed per NEC / manufacturers guidelines. All corner assemblies ensure a minimum bend radius of 2". Communications cabling is installed in a separate channel from 120VAC. A fill ratio of 60% is not exceeded.	U	70C-series raceway was observed at or beyond capacity. Divided surface raceways were observed with and without radia storage. Cables were observed without raceway.
Major Pathways - Cable Tray, Conduit	All major pathways are electrically continuous and grounded.	U	No pathway grounding was observed.

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ROM Estimates

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Onondaga Central School District
Technology Conditions Survey Report

Appendix B. Onondaga CSD Cost Sheet with Funding Sources (cont.)

Product	Notes	Quantity	Total	Funding Source	Priority
27 00 00 Communications					
Jr/Sr HS	Architectural, Power, Cooling, Grounding	6 EA	\$100,000.00		
Rockwell ES		2 EA	\$40,000.00		
Wheeler ES		2 EA	\$40,000.00		
		Total	\$180,000.00		
27 05 28 Pathways for Communications Systems					
Jr/Sr HS	Primary Horizontal Pathways, Cable Tray, Conduit, J-Hooks, Surface Raceway	2,600 LF	\$200,000.00		
Rockwell ES		500 LF	\$50,000.00		
Wheeler ES		955 LF	\$66,500.00		
		Total	\$383,500.00		
27 05 43 Underground Ducts and Raceways for Communications Systems					
District	Redundant Underground Service Provider Conduit	300 LF	\$7,500.00		
		Total	\$7,500.00		
27 05 53 Identification for Communications Systems					
Jr/Sr HS	Establish minimum technology systems record documentation: Record and standards-based labeling	119,204 SF	\$5,960.20		
Rockwell ES		\$1,821 SF	\$2,291.05		
Wheeler ES		\$7,424 SF	\$2,871.20		
		Total	\$11,422.45		
27 10 00 Structured Cabling					
Jr/Sr HS	CAT 6 UTP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	360 EA	\$90,000.00		
Rockwell ES	CAT 6 WAP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	100 EA	\$30,000.00		
Rockwell ES	CAT 6 UTP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	240 EA	\$60,000.00		
Wheeler ES	CAT 6 WAP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	35 EA	\$10,500.00		
Wheeler ES	CAT 6 UTP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	240 EA	\$60,000.00		
Wheeler ES	CAT 6 WAP Cabling, Patch, terminate and test. Includes Cable Connectors and Patch Panels	35 EA	\$10,500.00		
		Total	\$261,000.00		
27 13 23 Communications Optical Fiber Backbone Cabling					
Jr/Sr HS	Intra-Building Fiber Optic Cabling 50 micron/vm hybrid cable with LC connectors	1,300 LF	\$32,500.00		
Rockwell ES	Intra-Building to Wheeler; sm cable with LC connectors	1,000 LF	\$25,000.00		
Rockwell ES	Intra-Building Fiber Optic Cabling 50 micron/vm hybrid cable with LC connectors	700 LF	\$17,500.00		
Wheeler ES	Intra-Building Fiber Optic Cabling 50 micron/vm hybrid cable with LC connectors	300 LF	\$7,500.00		
		Total	\$82,500.00		

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Budget Funding Source Codes: Capital = 1 - Capital Project General = 1 - General Fund SSBA = 1 - SmartSchool Bond Act Allocation BOCES = BOCES Annual
Priority Codes: 1 = High 2 = Medium 3 = Low

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TCS Report: Compliance Overview



- **Instructional Technology:** Overall whiteboards and devices with refresh rates either in good condition or replacements planned.
- **Phone System:** Recently upgraded.
- **Professional Development:** .20 FTE Systems Integration Specialist; individualized staff development by building via online and hybrid courses meet district needs.
- **Tech Support:** 1.4 BOCES support (1.0 Network Admin & 0.4 LAN Tech), and tech-savvy internal staff available.
- **Security System:** Have already begun purchase and deployment of major components of an updated IP-based Security System.



TCS Report: Deficiencies Overview



- **Technology Infrastructure:** Insufficient cable quantities and locations; incorrect cable termination and installation; inconsistent data-outlet labeling; and, unprotected backbone fiber.
- **TRs:** Located in shared spaces; insufficient Racks clearances; no communications grounding infrastructure; and, improper cable supports and overfilled sleeves.
- **Data Network/Phone Access:** Minimal physical/logical redundancy; current PA system is nearing end-of-life.
- **Security System:** (2) different Access Control systems in use, and poor quality surveillance cameras.

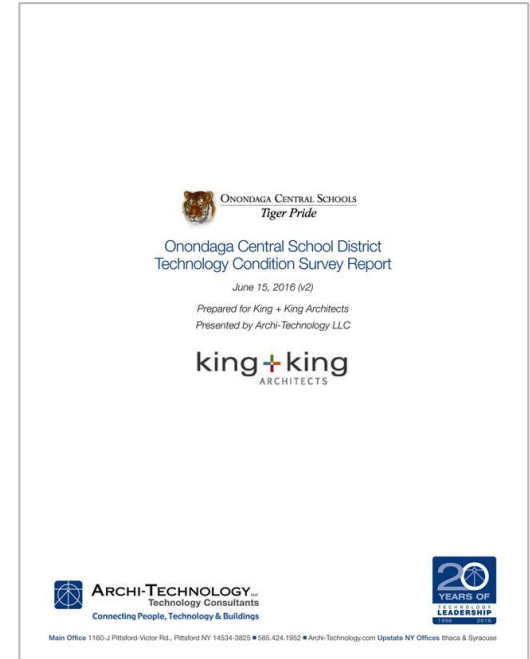


The Complete TCS Report



The complete Onondaga CSD TCS Report is available:

1. Executive Summary
2. Building-specific Current Technology Conditions
3. Building-specific Recommended Improvements
4. Building-specific TCS Sheets
5. Rough Order of Magnitude (ROM) Estimate





Future State: Onondaga CSD Goals and Objectives



OCSD: Mission and Goals



Mission

The Onondaga Central School Community challenges individual maximum potential, prides itself on success and prepares contributing citizens for life.

We get you ready for life!



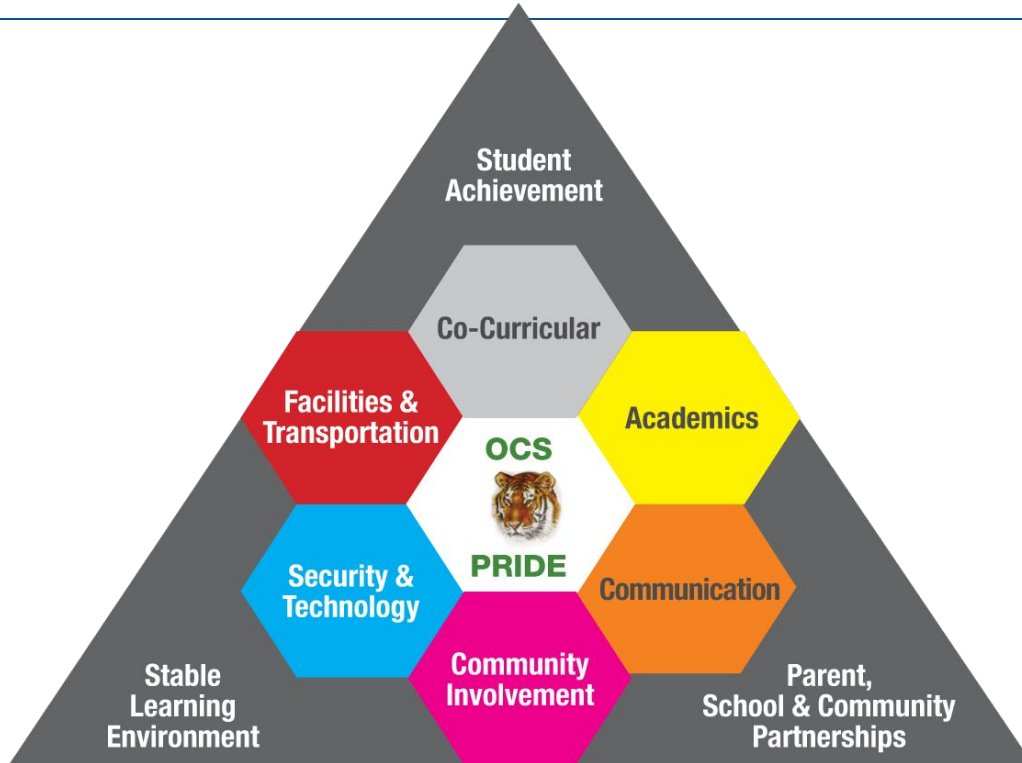
ONONDAGA CENTRAL SCHOOLS
Tiger Pride



ARCHI-TECHNOLOGY^{LLC}
Technology Consultants



District Goals



OCSD Instructional Technology Plan (ITP)

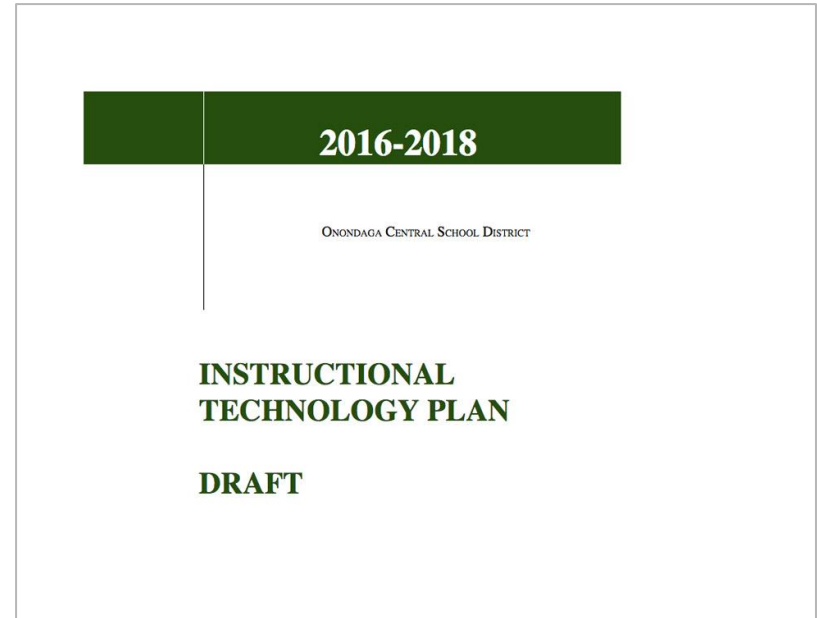


District ITP 2016 – 2018

Overall Objective

To support student learning through the use of technology in the classroom.

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ITP '16 – '18 Mission

- Prepare instructional staff to integrate technology while providing students and staff with appropriate access to technology tools that allows our community of teachers and learners to meet the demands of the 21st century.
- Effectively integrate technology into teaching and learning that promotes college and career readiness.
- Make technology decisions based on 21st Century Pedagogy and learning systems.





District ITP 2016 – 2018 (cont.)

Specific Long-Range Technology Goals

1. Effectively **integrate** technology to increase student achievement.
2. Provide robust and reliable **access** to current and emerging technologies for all students and staff.
3. Establish opportunities for **professional development** to improve student achievement through the use of technology.
4. Develop a system of **ongoing evaluation** to assess technology applications, implementation and instructional efficacy.

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Gaps Between Current Conditions and Goals

District-Wide

1. The District has annual constraints for funding to meet current and anticipated needs, even with one-time SSBA \$800,506 allocation.
2. Aging buildings (ca. 1930s – 1950s) have outdated technology infrastructures that can't handle current data-flow needs.
3. Increased demand for both devices and network access from instructors, students, support staff, and administrators.

Every available dollar must be spent **strategically** because district technology needs surpass available resources.

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Major Gap Between Current Conditions and Goals

Goal 1. Technology Integration

Insufficient technology infrastructure (backbone fiber and cabling).

Goal 2. Robust, Reliable Access

Insufficient technology infrastructure and spaces (pathways and TRs).

Goal 3. Professional Development

Increase FTE Tech Integration Specialist availability.

Goal 4. Ongoing Evaluation

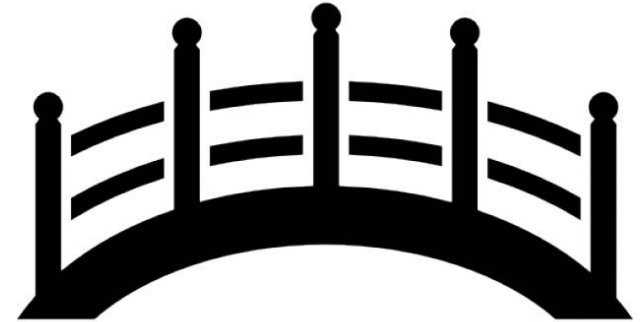
No major gaps currently identified.





Bridging the gaps between **Current Conditions** and **District Goals** based on available resources (including SSBA funds) requires a **strategic, comprehensive** and **holistic** plan that accounts for:

- Technology infrastructure
- Systems and components
- Devices
- Stakeholders
- Funding sources (SSBA, Annual Operating Budget, Annual Technology Leases, Grants)





The Roadmap The Comprehensive Technology Plan (CTP)



Comprehensive Technology Plan (CTP)



The district has developed its **Instructional Technology Plan (ITP)** which establishes **District Technology Goals** to which all subsequent funding plans must align.



Systems Key

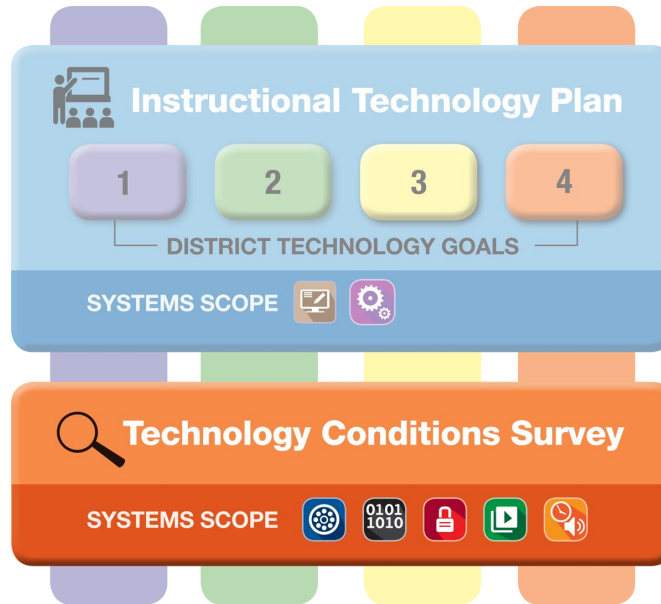
-  **CA** Cabling & Pathways
-  **CM** Data Networks
(includes **WA** Wireless Access, Devices and Networks)
-  **SS** Security Systems
(includes Access Control and Video Surveillance)
-  **AVI** Integrated AV Systems
(includes classroom systems)
-  **AVD** Distributed AV Systems
(includes Master Clock and Overhead Paging)
-  **INS** Instructional Systems
(includes Whiteboards & Devices)
-  **SW** Software



CTP (cont.)



Archi-Technology conducted a **Technology Conditions Survey (TCS)** that encompassed all the district's technology infrastructure and systems.



Systems Key

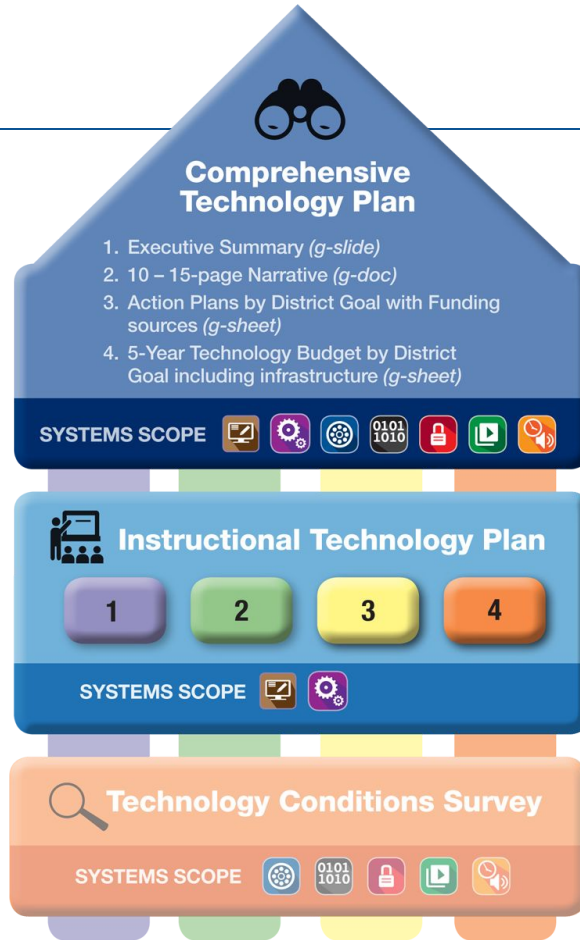
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CTP (cont.)



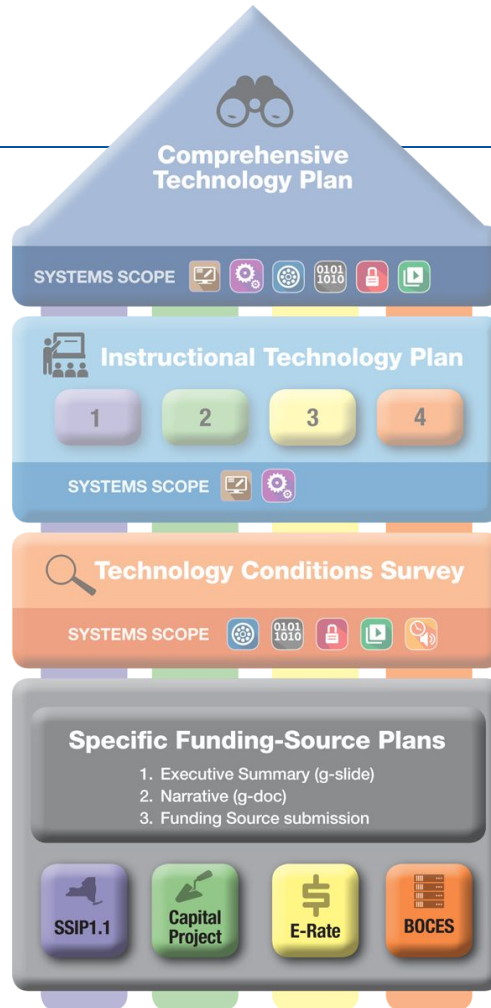
Archi-Technology worked closely with the district to develop a five-year **Comprehensive Technology Plan** that provides actionable plans with estimates and funding sources.



Systems Key	
	CA Cabling & Pathways
	CM Data Networks (includes WA Wireless Access, Devices and Networks)
	SS Security Systems (includes Access Control and Video Surveillance)
	AVI Integrated AV Systems (includes classroom systems)
	AVD Distributed AV Systems (includes Master Clock and Overhead Paging)
	INS Instructional Systems (includes Whiteboards & Devices)
	SW Software

CTP (cont.)

The district will develop and submit **Specific Technology Plans** based on funding source.



Systems Key

- CA** Cabling & Pathways
- CM** Data Networks (includes **WA** Wireless Access, Devices and Networks)
- SS** Security Systems (includes Access Control and Video Surveillance)
- AVI** Integrated AV Systems (includes classroom systems)
- AVD** Distributed AV Systems (includes Master Clock and Overhead Paging)
- INS** Instructional Systems (includes Whiteboards & Devices)
- SW** Software



OCSD Technology Goals



Optimal Deployment Sequence:

Goal 1.1 Upgrade Physical Infrastructure (cable, pathways, TRs)

Goal 1.2 Improve School Connectivity (servers, switches, routers)

Goal 1.3 Expand Wireless Coverage (WA systems)

Goal 2.1 Additional Student Computing Devices (laptops, tablets)

Goal 2.2 Upgrade Projectors & Interactive Displays (projectors, whiteboards)

Goal 3.1 Integrated Security Management System (SS systems)

Goal 4.1 Complete Technology Systems Modernization



OCSD Technology Funding Plans



Goal	Phase 1 SSBA Items	\$ Source	Est. Cost
1.1	Infrastructure (1 – 2 TRs/building w/limited cable) [ITP Goal 2: Reliable Access]	SSBA	\$535,006
1.2	Servers [ITP Goal 2: Reliable Access]		\$55,000
	Switches [ITP Goal 2: Reliable Access]		\$82,500
1.3	Wireless Upgrades [ITP Goal 2: Reliable Access]		\$128,000
SSBA Total			\$800,506

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OCSD Technology Funding Plans (cont.)



Goal	Phase 2 Items	\$ Source	Est. Cost
2.1	Devices (\$75k/year [x] 5 years) [ITP Goal 1: Integrate Technology]	BOCES Lease	\$375,000
2.2	Projectors and Whiteboards (\$25k/year [x] 5 years) [ITP Goal 1: Integrate Technology]	BOCES Lease	\$125,000
3.1	Integrated Security Management System [CTP Goal 3.1: ISMS]	Grants and State	\$200,000
Phase 2 Total			\$700,000

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OCSD Technology Funding Plans (cont.)



No.	Phase 3 2023/24 Future Capital Project Items	\$ Source	Est. Cost
4.1	Balance of Physical Infrastructure [ITP Goal 2: Reliable Access]	23/24 Capital Project	\$600,000
	Paging/Master Clock [CTP Goal 4.1: Complete Technology Modernization]		\$350,000
	Finish Security System [CTP Goal 3.1: Integrated Security Management System]		\$250,000
Capital Project-Related Total			\$1,200,000

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OCSD Technology Funding Plans (cont.)



No.	Phases	\$ Source	Est. Cost
1	Starting Infrastructure, Servers/Switches & Wireless	SSBA	\$800,506
2	Devices, Projectors/Whiteboards & ISMS	Various	\$700,000
3	Balance of Infrastructure and ISMS, Paging and Master Clock	Capital Project	\$1,200,000
District Multi-Year Technology Spend Grand Total			\$2,700,506





Onondaga CSD SSIP

Infrastructure, Servers/Switches & Wireless Upgrades

for the OCSD Board of Education's Approval at July meeting



SSIP



The district will submit **(1) Smart School Investment Plan** to the State SED in Sept. 2016 for review, approval and funding in 2017 to meet the stated goal:

1.1 Technology Infrastructure. 1 new TR in each Elementary School and (2) in the Jr./Sr. High School Building. Also includes limited new cabling.
Estimated Total Cost: **\$535,006**

1.2 Servers & Switches. Servers, Switches, Racks, Cabling, Training & Support.
Estimated Total Cost: **\$137,500**

1.3 Wireless Upgrades. Wireless Access Points.
Estimated Total Cost: **\$128,000**

Total SSBA Funding for SSIP Plan: \$800,506 (district allotment)





Schedule



SSIP - Timeline



Date	Milestone
July 19	SSIP Plan and Executive Summary <u>Draft</u> approved by Board
July 20	SSIP Plan and Executive Summary posted to district website for <u>30-day review</u>
July 28	SSIP Plan <u>Public Forum</u> - 4:30pm, High School Auditorium
Aug 23	SSIP Plan Public Review period ends including web-based submissions
Aug 23	Board <u>Final</u> approval of SSIP Plan

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SSIP Timeline (cont.)



Date	Milestone
Aug 24	Posting of Final SSIP Plan to district website
Aug 31	Target SSIP Submission to SSBA Portal
Oct 1	Target SSIP Plan submission to NYSED for review and approval
April 1, 2017	Start Bid Process
Summer '17	Construction





Questions and Discussion

