

PLAN for success



PLANNING SERVICES

1. [Technology Conditions Surveys](#)
2. [Comprehensive Technology Plans](#)
3. [Smart Schools Investment Planning \(SSIP\)](#)
4. [Technology Design Standards and Implementation Guides](#)
5. [Technology Room Master Plans](#)
6. [Instructional Technology Guidance](#)

Many NYS school districts face on-going technology-related challenges in one or more of these areas:

1. **Internal Resources:** Even with BOCES support, staff are focused on reactive service and maintenance issues making it difficult to take a proactive, strategic view of **all** technology systems.
2. **Budgets:** The variety of funding sources and their specific requirements make it difficult to ensure that available budgets are optimized in alignment with district goals.
3. **Rate of Change:** Technological capabilities are evolving at a dizzying pace making it especially challenging to select the correct combination of systems that cost effectively meet needs.

Archi-Technology LLC helps upstate NY school districts overcome these and other challenges by acting as an extension of your staff on an as-needed basis.

Our state-aidable **Technology Planning services** help districts optimize funding, meet short- and long-term goals, and establish a clear roadmap for the next ten years.



1 ASSESS your current state

with Technology Conditions Surveys of all district buildings.



Conducted by our Registered Communications Distribution Designers (RCDDs), **Technology Conditions Surveys (TCS)**:

- Objectively assess a district's current technology infra-structure and IP-connected systems (e.g., Communications, Instructional, Security);
- Provides recommended improvements to ensure all systems meet current industry best practices;
- Includes a Rough Order of Magnitude cost estimate for the recommended improvements.

These findings create the foundation for the development of a district-wide, ten-year Comprehensive Technology Plan (CTP).

[See the sample page from a Technology Conditions Survey Report.](#) ►

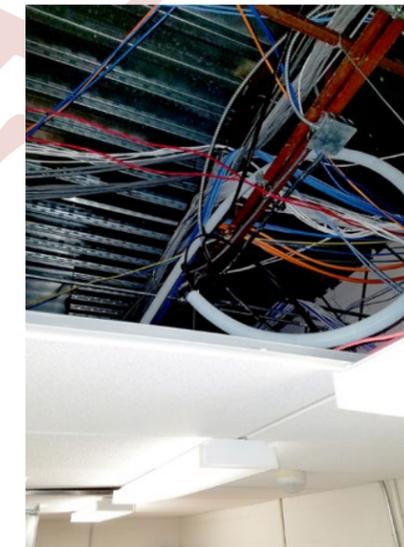
A traditional Building Conditions Survey (left gray area) doesn't include a district's critical technology systems (at right). These IP-connected systems are objectively assessed during a Technology Conditions Survey.

BUILDING CONDITIONS SURVEYS		TECHNOLOGY CONDITIONS SURVEYS	
<p>Architectural Systems</p> <p>Building Envelope, Exterior</p> <ul style="list-style-type: none"> • Structural Floors • Exterior Walls/Columns • Chimneys • Parapets • Exterior Doors • Exterior Steps, Stairs, Ramps • Fire Escapes • Windows • Roof and Skylights <p>Building, Interior</p> <ul style="list-style-type: none"> • Interior Bearing Walls and Fire Walls • Other Interior Walls • Carpet • Resilient Tiles or Sheet Flooring • Hard Flooring • Wood Flooring • Ceilings • Lockers • Interior Doors • Interior Stairs • Cleanliness <p>Other</p> <ul style="list-style-type: none"> • Site Utilities • Storm-water Management • Other Site Features (Pavement, Sidewalks, Grounds, etc.) • Substructure 	<p>Electrical Systems</p> <ul style="list-style-type: none"> • Interior Electrical Distribution • Lighting Fixtures and Lighting Quality <p>Plumbing Systems</p> <ul style="list-style-type: none"> • Water Distribution System • Plumbing Drainage System • Hot Water Heaters • Plumbing Fixtures <p>HVAC Systems</p> <ul style="list-style-type: none"> • Heat Generating Systems • Heating Fuel/Energy Systems • Cooling/Air Conditioning Generating Systems • Air Handling and Ventilation Equipment • Piped Heating and Cooling Distribution Systems • Ducted Heating & Cooling Distribution Systems • HVAC Control Systems • Environment/Comfort/Health <p>Life Safety Systems</p> <ul style="list-style-type: none"> • Fire Safety Systems • Smoke Detection System • Fire Suppression Systems • Emergency/Exit Lighting Systems • Emergency/Standby Power Systems 	<p>Technology Systems</p> <p>Technology Infrastructure</p> <ul style="list-style-type: none"> • Horizontal Cabling • Backbone Cabling • Pathways • Spaces including Technology Rooms (TRs) <p>Data Network</p> <ul style="list-style-type: none"> • Network Hardware (Wired) • Wireless Network • Security • Monitoring <p>Communications Systems</p> <ul style="list-style-type: none"> • Voice (Telephone) • Data <p>Integrated Audio-Video</p> <ul style="list-style-type: none"> • Classroom Instruction • Cable Television • Conference Rooms and Auditoriums <p>Distributed Audio-Video</p> <ul style="list-style-type: none"> • Public Address • Synchronized Clocks <p>Security</p> <ul style="list-style-type: none"> • Video Surveillance • Access Control • Intrusion Detection 	<p>Conducted by Archi-Technology as consultant to district's AOR</p>
5-YEAR DISTRICT CAPITAL PLAN		10-YEAR TECHNOLOGY PLAN	

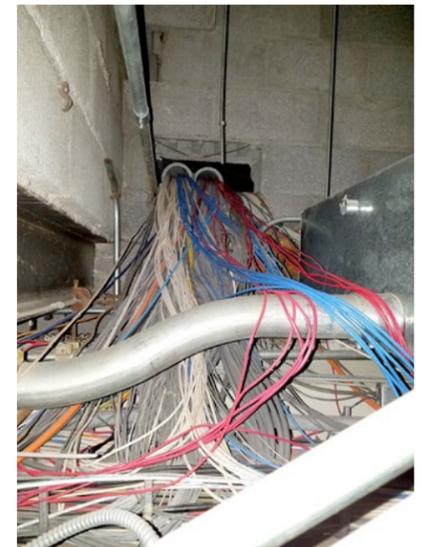
1. Technology Existing Conditions/Telecommunications Infrastructure/Rooms & Spaces (cont.)

Communications Pathways

- Cable Tray.** Cable tray is a center-hung, mono-style tray supported by threaded rod and is distributed throughout the building.
 - There are locations where the tray is not continuous creating sections where cabling is not supported.
 - Typically the cable tray has sufficient capacity for additional cabling. There are (2) locations that are exceptions to the typical conditions where the density of cable is at or over capacity:
 - Corridor outside room 709
 - Corridor outside the server room
- Cable Supports.** Additional cable supports are needed once the horizontal cabling exits the cable tray.
 - Some J-hooks are installed; however spacing exceeds 48".
 - In other locations bridal rings, which are not an approved cable support device, are used.
- Conduit and Conduit Sleeves.** Typically conduit and conduit sleeves are sized appropriately and meet the standard for fill ratio and installation.
 - Conduit ends need bushing to prevent cable damage during installation.
 - PVC conduit was used for sleeves from Room 108A. This material is not approved for interior communications pathways.
 - Surface raceways are lacking radius fittings at the turns. Inserts and bezel for terminating cable are not angled. This could result in the bend radius on the installed cable not complying to industry standards.
 - The primary communications pathways including cable tray and conduit over 6 feet long and not bonded. As a general overall condition, there is no communications grounding and bonding infrastructure.



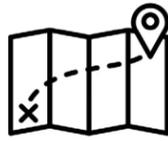
Missing cable tray



Example of insufficient cable support

continued

2 PLAN for alignment with a Comprehensive Technology Plan.



Successful planning starts by keeping end goals squarely in sight.

Archi-Technology's proven **Comprehensive Technology Planning (CTP)** service starts with your district's long-term goals and works to bridge the gap between current conditions and desired state.

Our CTPs account for refresh and upgrade cycles, as well as all existing district initiatives including:

- Instructional Technology Plans
- District Long-Range Plans
- Capital Construction Plans
- Security Plans
- Funding Plans (Smart School Bond Act, BOCES, E-Rate, etc.)

We work with district staff to identify and define new technology projects that are needed in the next ten years to meet district goals. Rough estimated project costs, appropriate funding sources, and time frames are established to provide districts with:

- Itemized technology-project cost estimates for the current and next nine years delivered via MasterLibrary's ML Plans™ Software.
- CTP visual ten-year Roadmap in PDF format that gets everyone on the same page. See the sample on pages 4 – 5.

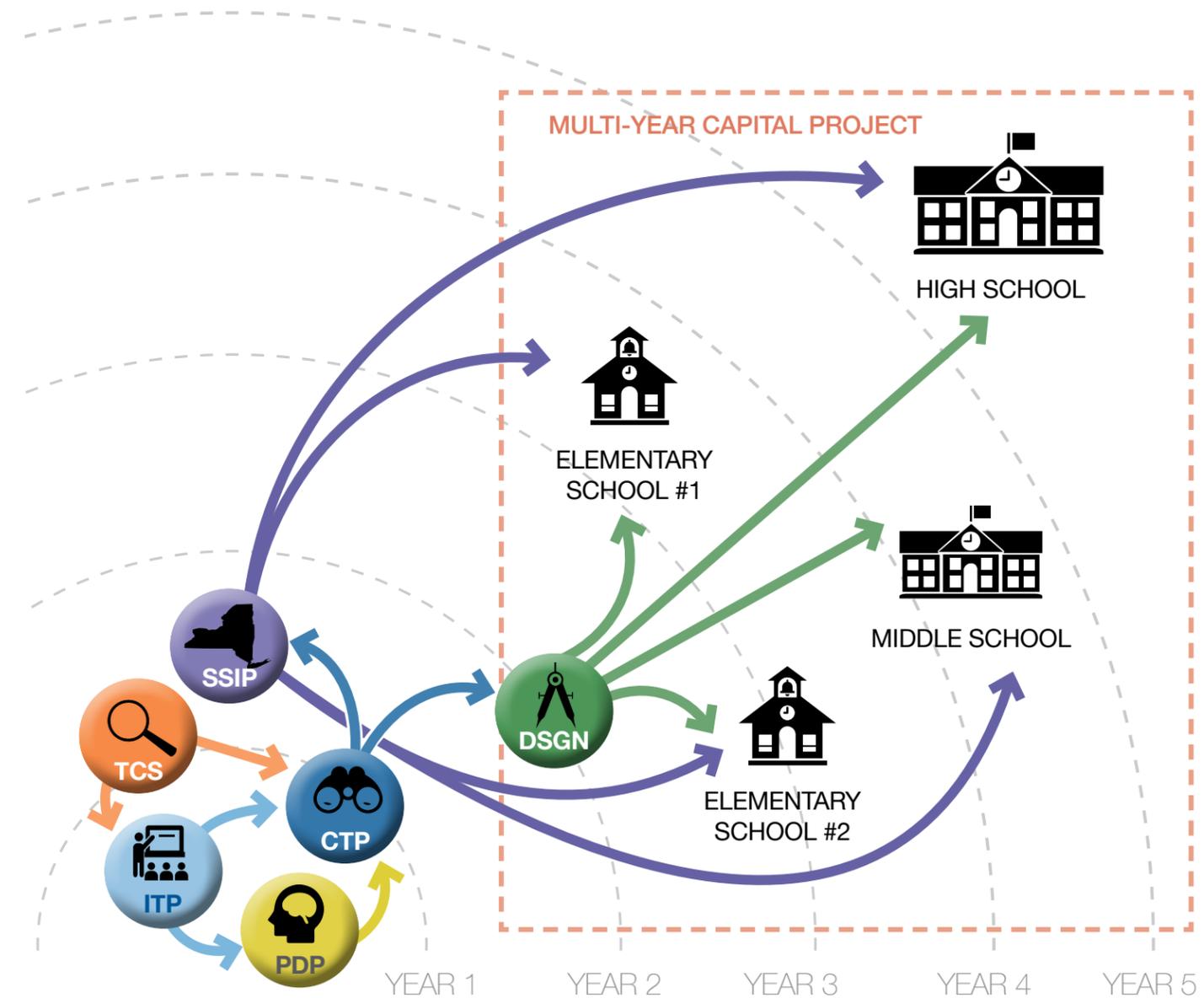
For districts that need them, **Smart School Investment Plan (SSIP)** guidance, assistance, and development are also available.

An effective Comprehensive Technology Plan starts with the district's long-term technology goals around which all existing and new projects are aligned.



A Comprehensive Technology Plan (CTP) accounts for a district's existing long-term plans with a technology component (below left) while providing a clear ten-year roadmap for future projects (at right in Years 2 - 5).

KEY TO PLAN TYPES					
	TCS	Technology Conditions Survey		CTP	Comprehensive Technology Plan
	ITP	Instructional Technology Plan		SSIP	SMART Schools Investment Plan
	PDP	Professional Development Plan		DSGN	Capital Project Design



See a sample Comprehensive Technology Plan 10-Year Roadmap on the next page. ►



1

BUILDING CODES

- E-1 Main ES
- E-2 South Bay ES
- E-3 Crabtree ES
- MS Middle School
- HS High School
- DO District Office
- 0-1 Bus Garage
- 0-2 Press Box
- ALL District-Wide

2

APPROVED CURRENT PROJECTS WITH TECHNOLOGY COMPONENT(S)

Project Name: High School Capital Project BUILDING CODE(S) HS
 Major renovation of East and West Wings of High School including asbestos abatement, reconfiguring of classrooms and other spaces, and Auditorium rebuild including AV systems.
Total Budget: \$13,450,000 [Capital Project Budget]

Project Name: Elementary Schools 1:1 Tablets E-1 E-2 E-3
 Approx. (1,200) tablets for Personalized Learning initiatives to be implemented in all ESs from 2018 – 2010. No refresh funds budgeted.
Total Budget: \$1,235,000 [85% Grant, 15% E-Rate]

Project Name: High School Parking Lot Upgrades HS
 Installation of Card Access control system and traffic gates in (2) HS lots and (1) District Office lot. Includes underground ducts and cabling to HS main CER on 1st floor of East Wing.
Total Budget: \$780,000 [Capital Project Budget]

Project Name: Middle School Library Computer Refresh MS
 Upgrade (36) desktop computers, (4) scanners, (2) printers and new tables, chairs with integrated electric, UPS and cord management system.
Total Budget: \$325,000 [BOCES]

Grand Total: \$15,790,000

3

DISTRICT TECHNOLOGY GOALS

1 Reliable Sustainable Technology Infrastructure (entrance facilities, fiber, cable, pathways, TRs)

2 Highly Reliable Network Connectivity (wired and wireless)

3 Enhanced Communications (building communications systems)

4 Safe School Environment (security systems)

5 Technology-Enriched Environments (classroom systems)

6 Personalized Learning (student devices)

7 Anywhere/Anytime Learning

8 Admin and Staff Computing Devices

9 Annual Instructional Software

10 Service Maintenance Agreements

TOP PRIORITIES FOR ALL DISTRICTS

PRIORITY OF THESE GOALS WILL VARY BY DISTRICT NEED

4

LIST OF ADDITIONAL TECH PROJECTS NEEDED

Project	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
1.1 School Connectivity Enhancements \$3,000,000				ALL						
1.2 Redundant WAN Connections \$438,000						ALL				
2.1 District-Wide Network Upgrades \$700,000				ALL						
2.2 WiFi Enhancements \$500,000					ALL					
2.3 Network Infrastructure Refresh \$500,000								ALL		
3.1 Upgrade ES and MS Telephone Systems/Clocks/PA \$302,600				E-1	E-2	E-3	MS			
4.1 Integrated Security Management System \$168,300									ALL	
4.2 Access Control & CCTV Devices \$800,000									ALL	
5.1 Whiteboard, Projectors & Peripherals Refresh \$45,000/year (x) 4 years = \$180,000										ALL
6.1 Student Computing Devices (Wave 1) \$823,000						MS	HS			
6.2 Student Computing Devices (Wave 2) \$823,000								MS	HS	
7.1 Community Connectivity \$700,000										ALL
8.1 Refresh Staff Laptops \$22,000/year (x) 10 years = \$220,000										ALL
8.2 District-wide Printer System \$12,000/year (x) 10 years = \$120,000										ALL
9.1 Annual Instructional Software \$8,500/year (x) 10 years = \$85,000										ALL
10.1 Access Control & CCTV Annual Maintenance \$2,275/year (x) 10 years = \$22,750										ALL
10.2 PA System Annual Maintenance \$1,250/year (x) 10 years = \$12,500										ALL

5

GOAL BUDGETS & POSSIBLE FUNDING SOURCES

Preliminary Goal Budget \$3,438,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$1,700,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$302,600
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$968,300
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$180,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: Operations

Preliminary Goal Budget \$1,646,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: Operations

Preliminary Goal Budget \$700,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$340,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: _____

Preliminary Goal Budget \$85,000
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: Operations

Preliminary Goal Budget \$35,250
 Check all possible funding sources:
 SSBA Allocation Capital Project
 BOCES E-Rate
 Other: Operations

VISION
School of the Future

6

How to Read this CTP Sample Roadmap
 Archi-Technology's Comprehensive Technology Plan (CTP) 10-Year Roadmap aligns existing **2** and new **4** technology projects against the district's long-term technology goals **3**. District buildings addressed in each project are shown **1**. Rough Order of Magnitude (ROM) project estimates and goal subtotals **5** are included to calculate a total 10-year budget **6**.

Archi-Technology
 Technology Consultants LLC

Connecting people, technology and buildings.

Archi-Technology.com 585.424.1952 Rochester, NY

TOTAL 10-YEAR ESTIMATED DISTRICT TECHNOLOGY BUDGET \$9,395,150

3 SECURE critical spaces with Technology Room Master Plans.



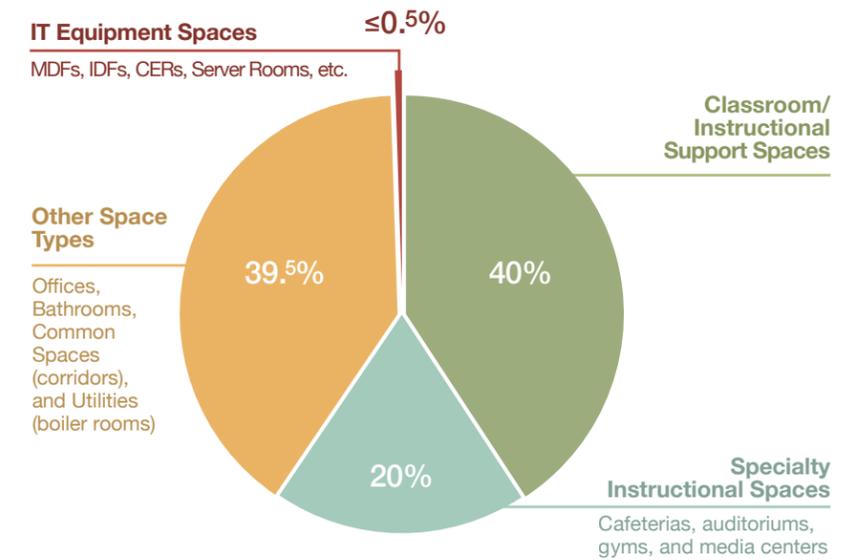
Whether your district refers to them as MDFs, IDFs, or something else, the **Technology Rooms (TRs)** that house your district's IT equipment are among the most important spaces in your buildings.

In addition to their operational importance, the condition of these spaces can affect your district's ability to meet student and staff data privacy requirements (NYS Law 2D).

As shown in the before-and-after photos below, there are a dozen categories of specifications that a Technology Room needs to follow to meet industry best practices.

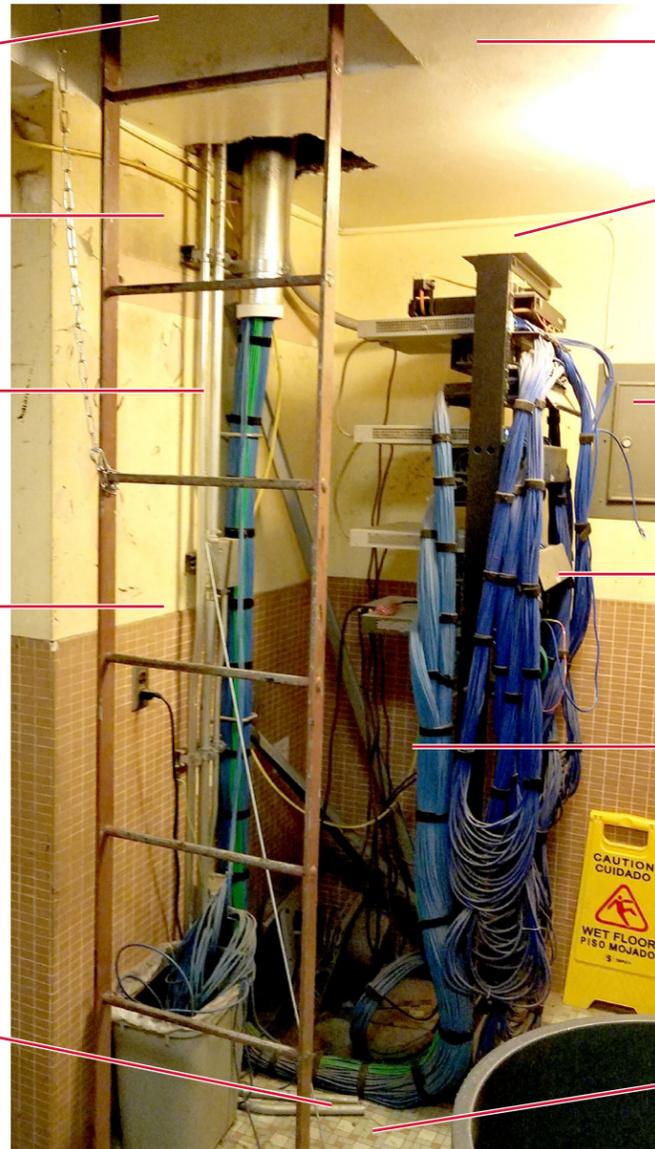
The most overlooked spaces in your district (at right). Spaces dedicated to housing IT equipment average less than 0.5% of a district's total interior square footage. Yet their importance to efficient, safe daily operations cannot be overstated.

As part of its Planning Services, Archi-Technology develops **TR Master Plans** for school districts to determine the optimal location for Technology Rooms while ensuring that all industry best practices are met.



Source: Averages based on (3) elementary school buildings and (1) middle/high school among (2) NYS school districts.

Before a Technology Room Master Plan: Assessing Poor Conditions



[2] Environment/location. Overhead utility pipes leave racks susceptible to damage from leaks/bursts.

[10] Room construction. Poor construction with no deck access and poor cable penetrations.

[7] Grounding infrastructure. Lack of this system increases the risk of electrical shortage and equipment damage.

[3] Security. Unsecured, shared space creates a security risk as well as possible accidental damage.

[6] Uninterruptible Power Supply (UPS)/Emergency Management Power (EMP). Lack of these systems can bring your network down during a power outage.

[2] Environment/location. Dirty, dusty environment increases risk of operating issues with rack components.

[12] Ceiling. Hard ceiling inhibits inspection and serviceability.

[8] Division 27 fit out. Lack of proper overhead cable management increases likelihood of cable damage.

[5] Power. Lack of an independent power circuit increases likelihood of power outage or failure.

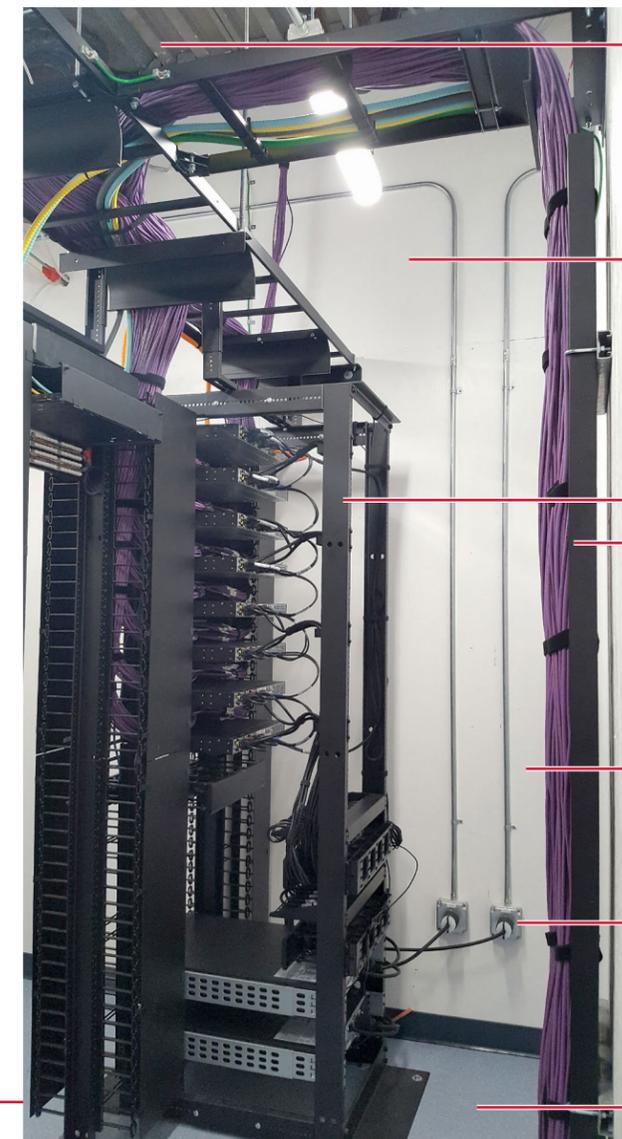
[9] Cable Termination and Management. No vertical cable management makes troubleshooting difficult.

[1] Inadequate rack clearances inhibit serviceability.

[4] No environmental controls increases risk of equipment overheating.

[11] Floor tile is not anti-static increasing risk of Electro-Static Discharge.

After a Technology Room Master Plan: Meeting Industry Best Practices



[2] Environment/location. Provides hallway access without any overhead utility pipes.

[3] Security. Secure or dedicated space, or locked cabinet.

[4] Environmental control. Independent controls in same room.

[7] Grounding infrastructure. Telecommunications Grounding Busbar (TGB) is installed.

[6] UPS/EM Power. Uninterruptible Power Supply and/or Emergency Power source.

[1] Room size. Allows rack front and back clearances.

[12] Ceiling. Open to deck with 10' minimum height

[8] Division 27 fit out. Overhead (horizontal) cable management and fire-resistant plywood wall.

[9] Cable Termination and Management. Adequate racks/cabinets and cable management

[10] Room construction. Walls extend to deck. Cable penetrations are compliant and sealed (fire stopped).

[5] Power. Dedicated circuit with circuit ID labels.

[11] VCT flooring. Anti-static tile.

4 STANDARDIZE best practices with Systems Design Standards and Installation Guides.



A school district's technology infrastructure and related building-based systems (e.g., security, instructional) are typically designed, installed, and deployed by numerous vendors and contractors over the course of many multi-year projects.

Yet districts often lack documented district-wide design standards to ensure a consistent baseline of best practices is applied to all completed technology projects regardless of vendor.

This also applies to systems installation which may be performed by in-house IT staff. The absence of documented installation best practices can cause interoperability issues in the future.

Ensure that all district systems operate as expected from Day One with **Technology Systems Design Standards and Implementation Guides** from Archi-Technology including:

- Division 27, Technology Infrastructure (Outside Cable Plant [OSP], Cabling, Pathways, Spaces)
- Division 28, Security Systems
- Audio/Visual Systems (Distributed and Integrated)
- Classroom Technology and Devices

Customized for a school district's unique needs, Technology Systems Design Standards ensuring that all technology systems designs follow industry best practices and inter-operate correctly with other systems.

Prepared by Archi-Technology LLC
for Anytown Central School District

Technology Systems Design Standards
Division 27, Technology Infrastructure

Product Standards for TR and Spaces

Racks

- **Size:** 19"w x 84"h
- **Type:** 4 post
- **Fittings**
 - Provide communications racks within each TR.
 - Racks must accommodate at least 33% growth after original design.
- **Preferred vendor:** See *Appendix A* for more information.

Cabinets

- **Size:** 19"w x 7'h x 28"d
- **Preferred vendor:** See *Appendix A* for more information.

Important Note: Cabinets are only to be used upon approval of the IT department.

Cable Management

- **Size:** 16"w x 7"h
- **Vertical Cable Management Fittings:** Provide a minimum of (2) vertical Front/Rear cable management to each rack.
- **Preferred vendor:** See *Appendix A* for more information.

Cable Runway

5 IMPROVE student outcomes with Instructional Technology Guidance.



Does your district face any of these challenges when selecting the classroom technology systems and products?

- Lack of product knowledge and available solutions.
- Subjective decisions based on a product's comfort level.
- Restricted decisions based on a single sales pitch.
- Administrators expected to facilitate the decision-making process without having adequate time nor experience

Our **Instructional Technology Guidance services** meet these challenges by providing unbiased, experienced facilitation of the entire procurement process. Because we act as an extension of your district's staff, we can be contracted for projects on an as-needed basis for:

- Needs analysis among stakeholder groups.
- Comprehensive vendor-agnostic product research.
- Facilitated group decision so all stakeholder voices are heard.
- Structured Vendor presentations with required talking points.
- A final recommendations report with an accurate cost estimate.

To get the most bang from your budget while meeting the true needs of various stakeholders, our Instructional Technology Guidance services provide a turnkey solution on a per-project basis.

Prepared by Archi-Technology LLC
for Anytown Central School District

Classroom Survey for Interactive Flat Panel (IFP) Placements:
Observations and Initial Recommendations

projector option, with the added benefit of a longer life and no supply costs (no bulbs to replace).

Results from surveys given at the end of the Vendor demonstration and Hands-on Q&A that were based primarily on Instructional software and classroom application are shown below. Teachers were asked to rate each vendor on a scale of 1 to 5, five being "I would love to have this in my classroom". The two results shown for each vendor are:

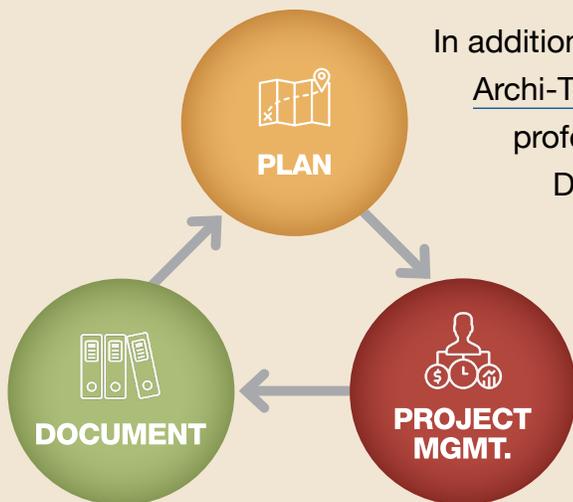
- 1) Pure "Percentage" of favorable responses versus unfavorable. A neutral 3 was considered unfavorable and so 1-3 was unfavorable, while 4-5 was favorable.
- 2) "Weighted Percentage" - Each response was given the value reflective of its rank so as to better identify a positive response from a negative response (eg a 5 on the scale received 5 points). Each response was tabulated and again divided so 1-3 was unfavorable, while 4-5 was favorable. A resultant score is also given by dividing the weighted positive response by the cumulative teacher response.

Teacher Survey Results

Manufacturer	Percent	Weighted Percentage	
	1-3 / 4-5	Weighted ratio	Percent Score
Promethean	25 / 75	5/25	83

EXPERIENCED guidance

for every phase of your school district's technology projects



In addition to the Planning services described in this brochure, Archi-Technology LLC provides NYS school districts with professional Project Management (Design/Build) and Documentation services that optimize budgets, meet short- and long-term goals, and improve quality.

Our state-aidable services are especially appropriate for smaller districts that lack the internal resources for a dedicated technology manager to coordinate initiatives and programs across departments and organizations including BOCES and vendors.

DOCUMENTATION SERVICES



Improve operations, reduce service call costs, and increase the usable lives of facility systems. A secure Electronic Facility Records (EFR) management system allows authorized staff and vendors to find any facility-related data or drawing in 30 seconds or less.

1. [EFR Project Management & Coordination](#)
2. [Existing Documentation Review](#)
3. [EFR Management System \(EFRMS\) Setup and Maintenance](#)
4. [Facilities and Systems Surveys \(AMEPT\)](#)
5. [Data Entry and Drafting Services](#)

PROJECT MANAGEMENT SERVICES



Take control of the technology components of capital and other projects. Our project management services coordinate the efforts of vendors and contractors to reduce Change Orders and ensure all systems operate correctly from Day 1.

1. [Technology Systems Design \(SD, DD & CD\)](#)
2. [Technology Systems Design Review](#)
3. [Technology Construction Bidding](#)
4. [Technology Procurement Assistance](#)
5. [Technology Construction Administration](#)
6. [Technology Construction Management](#)
7. [Technology Systems Commissioning](#)

For more information about our services, please visit Archi-Technology.com. Then call **585.286.4500** to discuss how we can help your district overcome its most difficult technology-related challenges.



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