



Millbury Public Schools

Technology Plan 2021-2025

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We Believe

- Learning must extend beyond the walls of our schools so that students can compete with their global peers. We must provide students with access to the curriculum anytime and anywhere and the necessary tools to personalize their education.
- Millbury Public Schools Technology Services must provide equitable access to technology, enabling safe but open access to high-quality digital resources and information.
- Millbury Public Schools must provide a digital environment that ensures the privacy and security of data and protects students' identities while encouraging staff to use data to inform instruction, curriculum, and assessment.
- Millbury educators should engage in professional learning that builds the competencies necessary to support 21st-century learning.
- The budget process and policies are designed to ensure innovation and the continual improvement of our students' experience while being fiscally responsible to the taxpayers.
- We will support tools and learning activities that utilize technology to enhance communication, collaboration, problem-solving, and creativity.

Teaching and Learning with Technology

In 2021

Before the 2021-22 school year, the district had spent significant resources purchasing Chromebooks and digital tools to support remote learning. Many teachers felt unprepared for a remote, digital classroom at the beginning of the pandemic due to Millbury's slow adoption of 1:1 devices and accompanying 21st-century tools. This led the district to embark on third-party audits of its networking infrastructure and educational technology vision. Edtechteacher completed this report to guide our educational technology initiatives over the coming years. Its findings and recommendations can be found throughout this document. School administrators and faculty members currently need to share and embrace a similar vision of purposeful technology use in education. The district has "pockets of excellence" of excellent teaching with technology. Still, there are no common classroom expectations or strategies from classroom to classroom, grade to grade, or school to school.

School administrators and faculty have yet to work together to discuss the purpose of technology in teaching and learning nor crafted a shared mission for leveraging technology moving forward. At this time, technology is seen as an organizational tool and a conduit to specific online resources and tasks, and it is not used to construct meaningful, purposeful, and engaging lessons and activities.

Classrooms and learning spaces do not easily support student-based technology instruction or other multimedia-based tools. Students cannot charge Chromebooks in the classroom, and there is no central system to maintain the inventory of student devices.

The following are responses to a teacher survey conducted by Edtechteacher in 2021. The question was, how is technology currently used in Millbury?

- "As a newer teacher, all my files are digital and stored on Google Drive. This is also helpful

for students who struggle with organization. If all my assignments are on Google Classroom, they will keep them in their backpacks or leave them at home.

- "Our new 7th and 8th-grade curriculum is on an online platform. I also use Google Classroom to manage announcements and assignments that have a digital option."
- "I use it daily, multiple times daily—to show math video lessons, use the document camera to demonstrate with manipulatives on the smartboard, display stories via YouTube, etc."
- "We want students to see what we are working on and to be able to share that with them in Google Classroom as a reference for later."
- "I use it to project our math curriculum and reading program to listen to the week's story. I also use Google Slides daily to give the students directions on what to work on."
- "Students take spelling tests using Google Forms. Books may be assigned via the Wonders program at their instructional level."
- "I use a math program to show videos and read problems from my comp."
- "Streamlines assignments and grading. Easier communication with students."
- "We do everything on our computers. We often look at test scores, apply data, email, communicate with parents, etc."
- "Create slideshows to deliver instruction."
- "Instructional videos, zoom meetings with parents."
- "All of our textbooks and assessments are online."

For several years, the district has made UDL (Universal Design for Learning) a focus area. UDL is a framework to improve and optimize teaching and learning for all based on scientific insights into how humans learn. Our 1:1 program and classroom technology have played an essential role in enabling teachers and students to access the curriculum equitably. Technology Services must support this initiative by providing access to edtech tools that support multiple means of engagement, action, expression, and representation.

By 2025

To prepare students for the challenges of an interconnected, globalized, STEM-based economy and society, we need to modernize our approach to how technology can be used in the classroom. Our goal should be to prepare students for an ever-changing labor market and, more broadly, as citizens in a society where technology presents opportunities and challenges. We should utilize technology to prepare students for an evolving future where technology will automate most basic functions, and users will need to leverage technology to innovate and solve problems. This means rethinking how we teach, how we learn, and the skills we prioritize. We must empower students to be critical thinkers, creative problem solvers, and lifelong learners who can adapt to new technologies and industries. By doing so, we equip them to navigate the workforce and shape the world around them.

How will we get there?

Millbury Public Schools is in a transitional phase regarding integrating technology into the learning environment. To achieve our planned goals, we will:

Establish a Unified Vision and Mission:

- Collaborate with school administrators and faculty to craft a shared vision and mission statement for technology integration in teaching and learning.

- Define clear goals and objectives aligned with the belief that learning must extend beyond school walls, emphasizing personalized education, equitable access, and data-driven instruction.

Professional Development:

- Implement ongoing professional learning opportunities to build competencies and skills to support 21st-century learning.
- Provide training on Universal Design for Learning (UDL), blended learning strategies, personalized learning approaches, and effective use of educational technology tools.

Curriculum Integrations:

- Encourage teachers to move beyond using technology as an organizational tool and leverage it to construct meaningful, purposeful, and engaging lessons.
- Promote technology integration to enhance teaching and learning experiences across all subject areas.
- Support the development of digital curriculum resources that align with the district's learning objectives and standards.

Student Skills Development:

- Design learning experiences that foster the development of essential 21st-century skills, including communication, collaboration, problem-solving, data literacy, and digital citizenship.
- Integrate technology tools and platforms that enable students to be creative, collaborate, and publish their work to a broader audience.
- Provide opportunities for students to develop leadership, teamwork, adaptability, self-management, organizational, computer, and problem-solving skills through project-based learning and real-world application.

Evaluation and Continuous Improvement:

- Establish mechanisms for evaluating the effectiveness of technology integration initiatives, including surveys, focus groups, and data analysis.
- Use feedback from stakeholders to make informed decisions and adjustments to the implementation plan.
- Continuously monitor and assess progress towards meeting the established goals and adjust strategies to ensure continual improvement.

Enabling Access and Effective Use

In 2021

Connectivity

The faculty continues to express the need for improvements to Internet connectivity. When asked to identify the two items that they consider most important to devote resources, faculty members chose “improving wireless access network on campus” (79.4%) and “Updating or enhancing Chromebooks or other classroom hardware” (a distant second at 52.6%). There is no plan to address the growing reliance on WIFI and network applications and systems.

The following are responses to a teacher survey conducted by Edtechteacher in 2021. These responses concern current Internet and infrastructure issues.

- "A more efficient and dependable connection to the internet, easier access for kindergarten students to log on independently. Chromebook trackpads are also a challenge for my students to manipulate."
- "More stable internet connection, less printer issues."
- "If the internet AND printers get fixed, I'd be thrilled and happy with our current tech setup."
- "I would like to see more stable Internet connections and improvements to my desktop."
- "Better network connectivity and updated hardware."
- "I would like a stable internet connection in all areas of the building and printers that work."

Teaching and Learning Devices

Classroom technology, including Chromebooks, teacher devices, presentation tools, WIFI, and communication tools, has not been refreshed in several years. There is currently a plan to refresh classroom PCs with laptops at Elmwood, Shaw, and the JSJS, but this plan has only been implemented for Elmwood.

The overall network also needs updating. Teachers complain of network slowness and unreliability, and there are many WIFI dead spots across the school. Many of the major components of the network haven't been in place for over ten years and were originally set up to support a wired infrastructure.

- "Consistent working internet & copier; my teacher's Chromebook is old and slow."
- "One where students have devices that are charged, and the network connectivity is solid."
- "1:1, which we have in place, reliable wifi, removal of distracting devices (phones)."
- "Each student has their own Chromebook and can bring it to a small group setting!"

Policy, Cybersecurity, and Student Data Privacy:

Many policies regarding access to the network and responsible use have not been updated in several years, and teachers have not historically been involved in this process.

The district uses an expensive antivirus platform and lacks advanced tools to identify and remediate modern threats. It also does not provide staff training on identifying threats and scams, which puts the district at risk of cybersecurity breaches.

The district does not have robust protocols and safeguards to protect personally Identifiable Information (PII). Students and teachers frequently use digital tools that collect PII and are unaware of the implications of connecting an application to their Google accounts.

The district does not use Single Sign-on (SSO) or two-factor Authentication (2FA), which puts sensitive information at risk.

By 2025

The district plans to establish updated and comprehensive guidelines for network access, responsible use, and student data privacy by involving teachers in policy development. Through

collaboration, these policies will reflect current best practices and regulatory requirements, fostering a culture of accountability and trust among staff and students.

The district will invest in cybersecurity tools and platforms to defend against modern threats. Staff members will receive regular cybersecurity training, empowering them to identify and respond to potential threats effectively. With robust protocols to safeguard personally identifiable information (PII), the district will ensure compliance with privacy regulations and mitigate the risk of data breaches.

Millbury Public Schools will also implement measures to enhance data privacy, including educating staff and students on responsible data handling practices. By utilizing Single Sign-On (SSO) and two-factor authentication (2FA), the district will bolster the security of digital accounts, reducing the risk of unauthorized access to sensitive information. Through proactive measures and continuous improvement, the school community will demonstrate a steadfast commitment to protecting the privacy and security of all stakeholders' information.

How will we get there?

Infrastructure Upgrades:

- Develop a comprehensive plan to upgrade network infrastructure and improve WIFI access throughout the school.
- Prioritize reliable, high-speed internet connectivity investments to support teaching and learning activities.
- Implement measures to address WIFI dead spots and ensure consistent access to digital resources across the school.

Device Refresh Program:

- Expand the device refresh program to ensure that classroom technology, including Chromebooks and teacher devices, is regularly updated and maintained.
- Allocate resources to replace outdated devices and provide teachers and students access to reliable, up-to-date technology tools.

Cybersecurity and Data Privacy Measures:

- Review and update policies regarding network access, responsible use, and student data privacy in collaboration with teachers and other stakeholders.
- Invest in advanced cybersecurity tools and platforms to effectively detect and mitigate modern threats.
- Provide comprehensive training and awareness programs for staff and students to educate them about cybersecurity best practices and the importance of protecting PII.
- Implement 2fa and SSO on all accounts with sensitive information access.

Collaborative Leadership:

- Establish a collaborative structure that includes teachers in the decision-making process of technology policies and initiatives.
- Create avenues for feedback and communication to ensure that the needs and concerns of faculty members are addressed in technology planning and implementation.

Data Protection Protocols:

- Implement robust protocols and safeguards to protect personally identifiable information (PII) and ensure compliance with data privacy regulations.

- Educate teachers and students about the implications of connecting digital tools to their accounts and provide guidelines for safe and responsible use of technology resources.

Creating a Culture and Conditions for Innovation and Change

In 2021

Historically, the culture for using technology in the classroom has been to access information, such as digital textbooks and online content, and to complete traditional educational tasks, such as classroom presentations and written assignments. Classroom teachers utilize Google Classroom to facilitate the distribution and collection of classwork and organize their class materials.

The following are responses to an administrator survey conducted by Edtechteacher in 2021. Administrators presented their vision for how technology could be used in the classroom.

- *"They use it mostly to replace traditional methods (working with an online text instead of a tangible book). I'd like to see more technology that allows students to explore their role in the world and apply what they are learning beyond their classroom walls."*
- *"I want to ensure teachers are not just using technology at its surface level. I would like to see it used to individualize instruction for students regarding their ability to access information and represent their understanding."*
- *"Technology is used, for the most part, to replicate practices (substitution) rather than to enhance instruction."*
- *"It is used too much for presentation only."*

Technology use is limited to completing tasks and accessing various systems that make the building run outside of the classroom. Many of these systems have been neglected over the years, and the philosophy is that if it isn't completely broken, there is no need to fix it. Examples are antiquated security camera systems, bell and clock systems, and other data warehousing applications and tools necessary for a school's operation.

Millbury maintains a reliance on legacy printing systems. The educational community has not embraced the digital delivery and receipt of information to and from parents and outside agencies. The district maintains an inventory of over fifty photocopy machines and thirty stand-alone printers. Many of these devices are not networked, and the current conditions have multiple devices in a location. Many of these machines are inefficient, and staff are unaware of the discrepancies in the printing costs of each.

By 2025

We want to develop a culture where classroom technology supports student and teacher communication, collaboration, problem-solving, creating, and publishing. The tools we use in the classroom should support these necessary skills and be continually evaluated and improved upon.

The district needs to develop a plan to continually evaluate building systems to ensure educators use tools that help them be more productive and efficient.

The district must reduce printing costs and provide staff with modern tools to manage digital documents. We need to educate staff on printing costs and provide them with equitable and efficient means of printing.

How will we get there?

Edtech Leadership:

- Provide comprehensive professional development focused on strategies that leverage technology to support student communication, collaboration, problem-solving, creation, and publishing.
- Offer training on blended learning, project-based learning, and other student-centered instructional approaches.
- Collaborate with building and district leadership to outline the district's goals regarding digital information delivery and receipt. Then, collaborate with staff to implement this vision.

Technology Integration:

- Develop guidelines and resources for integrating technology into the curriculum to support the development of essential skills such as communication, collaboration, and problem-solving.
- Provide teachers with support in designing lessons and activities that empower students to explore their interests and apply their learning in real-world contexts.

Modernization of Systems:

- Conduct a thorough assessment of existing tools and systems to develop a plan for modernization and maintenance.
- Prioritize upgrades to essential building systems to improve efficiency and reliability.

Continuous Evaluation:

- Establish processes for continually evaluating the effectiveness of classroom technology use and building systems.
- Solicit stakeholder feedback and use data to inform decision-making and identify areas for improvement.
- Regularly review and update goals and priorities.

Community Engagement:

- Involve stakeholders, including teachers, students, parents, and community members, in the planning and implementing of technology initiatives.
- Foster a culture of collaboration and innovation by creating opportunities for stakeholders to contribute ideas and provide feedback.

Replacement Plan

Network and Infrastructure

Wireless

Access points are typically refreshed in five-year increments and are reimbursed 60% by the federal government. The Shaw APs were purchased for the building project and will have a

longer life. The JSHS and Elmwood APs must be replaced prior to their end-of-service date of Jul 21, 2026. The goal is to renew all district APs simultaneously in 2032.

- Elmwood - (59) Indoor APs
- Elmwood - (1) Outdoor APs
- Shaw - (69) Indoor APs
- Shaw - (7) Outdoor APs
- JSHS & CO - (96) Indoor APs
- JSHS & CO - (5) Outdoor APs

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Shaw Hardware		1	2	3	4	5	6	7	8	2032
Shaw Licensing		1	2	3	1	1	2	3	4	2030
Other Hardware		3	4	5	6	1	2	3	4	2032
Other Licensing		2	3	4	1	1	2	3	4	2030
Five-Year eRate Funding Cycle					Five-Year eRate Funding Cycle					

Switching

Switching typically gets refreshed on 7 to 9-year cycles and reimbursed at 60% by the federal government. Switching and wireless share the same licensing schedule. Licensing typically gets purchased in five-year increments and is reimbursed at 60% by the federal government.

- Elmwood - (3) MS390
- Elmwood - (12) MS125
- Shaw - (4) MS390
- Shaw - (22) MS125
- JSHS & CO - (4) MS390
- JSHS & CO - (4) MS125

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Hardware		11	1	2	3	4	5	6	7	2032
Licensing		3	4	1	1	2	3	4	5	2030
Five-Year eRate Funding Cycle					Five-Year eRate Funding Cycle					

Firewall

- District - (1) Sophos XG650

Servers

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
MPS-VM		4	5	6	1	1	2	3	4	2033
MPS-BACKUP				1	2	3	4	5	6	
MPS-EXAQ		3	4	5	6	7	8	9	10	2031
SHAW-VM		1	2	3	4	5	6	7	8	2031
SHAW-AVIG		1	2	3	4	5	6	7	8	2031
ELM-VM		4	5	6	7	8	1	2	3	

Phone systems typically have long life spans and are only upgraded when hardware begins to fail or when they are moved from analog to digital. Licensing is purchased yearly and when you move a handset from analog to digital.

[illegible]

Security Cameras

Security cameras are typically replaced when the image's resolution can no longer identify objects. When an analog camera is replaced, it is replaced with a digital IP-based camera. Frequently, building administration requests that cameras be added to cover dead-spot areas. When analog cameras are replaced with digital cameras, the cameras must be licensed. Additionally, each school's system needs to be licensed at three-year intervals. Security camera servers will sometimes need to be upgraded to add storage space.

- Elmwood - 8 External
- Elmwood - 33 Internal
- Shaw - 109 External
- Shaw - 61 Internal
- JSHS - 37 External
- JSHS - 55 Internal
- CO/Garage - 8 External
- Windle - 6 External

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Shaw Licensing		1	2	3	1	2	3	1	2	
Other Licencing		1	2	3	1	2	3	1	2	

Staff Devices

Staff use two types of devices depending on their role in the school. Office staff who do not need their devices to be mobile use desktop PCs, and the remainder of the staff use laptops, docking stations, and secondary monitors at their desks. Laptop replacement cycles range from 5 to 7 years, depending on use. PCs typically have a slightly longer refresh cycle.

- Elmwood PCs - 17
- Elmwood Laptops - 73
- Shaw PCs - 15
- Shaw Laptops - 78
- JSHS & CO PCs - 172
- JSHS & CO Laptops - 1115

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Elmwood		1	2	3	4	5	6	7	2	
Shaw			1	2	3	4	5	6	1	

JSHS & CO	1	2	3	4	5	6	2	
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Chromebooks

Students and Paraprofessionals are all issued Chromebooks. Chromebooks typically last 5-7 years but require frequent maintenance.

- Dell Chromebook 3110 - 435
- Acer C734T (Shaw) - 589
- Dell 3100 (JSHS) - 1144
- Acer CXI5 (Shaw) - 29

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Dell 3110			1	2	3	4	5	6	7	2031
Dell 3100		4	5	6	7	8	9	10	1	
Acer C734T		1	2	3	4	5	6	7	8	2031
Acer CXI5			1	2	3	4	5	6	7	2032

Classroom Multimedia

Projectors & Interactive Panels

Classroom projectors utilize two different technologies: laser and lamp-based. Laser projectors are a newer technology and have a refresh cycle of 10-12 years. Lamp-based projectors have a shorter lifespan and must be replaced in 5-7 years. Each year, we evaluate all of the projectors and budget for a flat number of replacements based on the usage and function of the device.

Interactive panels are a newer technology in the same category as a laser projector. They have a long lifespan and are typically only replaced if they break.

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	EOL
Elmwood					16	16	6	0	0	
Shaw		27	0	0	1	0	0	0	0	
JSHS		5	5	4	2	2	2	2	2	

Hardware, Software, & Infrastructure Capital Projections

Based on the above information, we can expect to see estimated costs for replacing equipment on the following schedule. The above categories are the most expensive and do not capture all of the district's hardware replacement costs. Historically, the replacement costs of infrastructure and classroom technology have been funded through warrant articles.

Some of the items are eligible for eRate reimbursement; others are not. The total costs below assume eRate reimbursement of 60% on eligible items, and the costs below include the 40% district match

FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029
115K	115K	\$225K	\$90K	\$124K	~175K	~50K	~600K	~50K