

An Overview of the Budget for  
Merrimack School District  
Technology and Library Media Services  
2019-2020

Merrimack School District Technology and Library Media Services continues its work of supporting the teaching, learning, and operational functions of the Merrimack School District. The 2019-2020 budget supports replacement and addition of mobile student devices to decrease the student to device ratio, improve access to the math and writing curriculum, increase digital skills, improve educators' ability to personalize/differentiate, and reduce impacts of online assessments. This budget also supports the ongoing improvement of classroom instructional technology with the addition of projection inputs and the installation of soundfield systems, which adhere to a universal design approach to learning environments.

In addition to a commitment to replacing and upgrading cabling, wireless and other network infrastructure, this budget reflects the replacement of the 9 year old Storage Area Network (SAN). The SAN provides streamlined management of a range of locally hosted network servers and storage. This budget also reflects software purchases necessary to ensure compliance with the HB 1612 amendment to RSA 189:66 in support of student data privacy and network security.

Submitted by,

A handwritten signature in black ink, appearing to read 'Nancy Rose', with a stylized flourish at the end.

Nancy Rose  
Director of Technology and Library Media Services

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**OBJECT - Purchased Property Services - (8400)**

**100-2222-36-8430-07 - Instructional Equipment Repairs/AV/Library**

<b>2017-2018 Budgeted</b>	<b>\$ 4,000.00</b>
<b>2017-2018 Expended</b>	<b>\$ 4,534.70</b>
<b>2018-2019 Budgeted</b>	<b>\$ 4,000.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 4,500.00 ✓</b>

To pay for repairs of instructional technology equipment such as laptops, listening centers, data projectors, interactive equipment, and document cameras; and to cover service contracts for laminators. The increase is due to the addition of mobile devices sent out for repair.

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**OBJECT - Other Purchased Services - (8500)**

**100-2221-36-8531-07 - Telephone/Library**

<b>2017-2018 Budgeted</b>	\$ 614.00
<b>2017-2018 Expended</b>	\$ 212.41
<b>2018-2019 Budgeted</b>	\$ 587.00
<b>2019-2020 Proposed</b>	\$ 420.00 ✓

To provide telephone service to the office of the Director of Technology and Library Media Services. This account represents a three-year average.

**100-2221-36-8534-07 - Postage/Library**

<b>2017-2018 Budgeted</b>	\$ 494.00
<b>2017-2018 Expended</b>	\$ 224.22
<b>2018-2019 Budgeted</b>	\$ 340.00
<b>2019-2020 Proposed</b>	\$ 307.00 ✓

To provide postage for correspondence including letters to parents/guardians regarding library materials or to ship equipment out for repairs. This represents a three-year average.

**100-2222-36-8551-07 - Binding of Books/Library**

<b>2017-2018 Budgeted</b>	\$ 1,500.00
<b>2017-2018 Expended</b>	\$ 1,494.32
<b>2018-2019 Budgeted</b>	\$ 2,000.00
<b>2019-2020 Proposed</b>	\$ 1,500.00 ✓

To provide for rebinding of books when the binding has worn out, especially when a title is used but no longer in print. To identify and bind highest-use materials that are difficult or prohibitive to replace. The decrease is based on current usage of service.

**100-2221-36-8580-07 - Travel/Library**

<b>2017-2018 Budgeted</b>	\$ 300.00
<b>2017-2018 Expended</b>	\$ 381.85
<b>2018-2019 Budgeted</b>	\$ 300.00
<b>2019-2020 Proposed</b>	\$ 300.00 ✓

To reimburse the Director of Technology and Library Media Services and staff for district-related travel.

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**OBJECT - Supplies and Materials - (8600)**

**100-2221-36-8610-07 - Office Supplies/Library**

<b>2017-2018 Budgeted</b>	\$ 300.00
<b>2017-2018 Expended</b>	\$ 353.73
<b>2018-2019 Budgeted</b>	\$ 300.00
<b>2019-2020 Proposed</b>	\$ 300.00 ✓

To purchase items such as letterhead stationery and envelopes, printer paper used in the Technology and Library Media Services office.

**100-2222-36-8610-07 - Supplies/Library**

<b>2017-2018 Budgeted</b>	\$ 15,000.00
<b>2017-2018 Expended</b>	\$ 15,050.93
<b>2018-2019 Budgeted</b>	\$ 15,000.00
<b>2019-2020 Proposed</b>	\$ 16,000.00 ✓

To purchase supplies used to provide technology and library media services to students and staff. Items include various cables, small network switches, projector lamps and filters, technology supplies, book covering materials, bar codes and batteries. As devices increase so does the need for adaptors, cables and covers.

**100-2222-36-8641-07 - Books/Library**

<b>2017-2018 Budgeted</b>	\$ 40,000.00
<b>2017-2018 Expended</b>	\$ 38,719.02
<b>2018-2019 Budgeted</b>	\$ 40,000.00
<b>2019-2020 Proposed</b>	\$ 40,000.00 ✓

To purchase new and replacement titles for the general, reference and professional library collections serving the literacy, instructional and research needs of the students and staff of the entire district.

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**OBJECT - Supplies and Materials - (8600) continued**

**100-2222-36-8646-07 - Periodicals/Library**

<b>2017-2018 Budgeted</b>	<b>\$ 3,000.00</b>
<b>2017-2018 Expended</b>	<b>\$ 2,980.34</b>
<b>2018-2019 Budgeted</b>	<b>\$ 3,000.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 2,500.00</b>

To purchase newspapers and periodicals for the students and staff served by the Merrimack School Library Program in support of the district's literacy initiatives, classroom instruction and professional development. The decrease is due to reduced demand for print periodicals and increased access to online versions.

**100-2222-36-8649-07 - Other Inst. Media/Library**

<b>2017-2018 Budgeted</b>	<b>\$ 3,000.00</b>
<b>2017-2018 Expended</b>	<b>\$ 2,966.56</b>
<b>2018-2019 Budgeted</b>	<b>\$ 3,000.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 3,000.00</b>

To purchase and license non-print instructional materials used by students and staff in the Merrimack School District.

**100-2222-36-8650-07 - Software & Licensing/Library**

<b>2017-2018 Budgeted</b>	<b>\$ 175,000.00</b>
<b>2017-2018 Expended</b>	<b>\$ 176,073.09</b>
<b>2018-2019 Budgeted</b>	<b>\$ 185,000.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 200,000.00</b>

This line item covers licensed and purchased instructional software, research databases, district websites, classroom management, credit recovery, electronic transcript services, software in support of technology and library media services, and software selected to support specific content area instructional goals. The increase is due to the need to purchase systems for advanced device management and tracking software to maintain compliance with the HB 1612 amendment to RSA 189:66.

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**OBJECT - Property/Library - (8700)**

100-2222-36-8730-07 - Additional Equipment/Library

<b>2017-2018 Budgeted</b>	<b>\$ 30,000.00</b>
<b>2017-2018 Expended</b>	<b>\$ 29,752.83</b>
<b>2018-2019 Budgeted</b>	<b>\$ 30,000.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 21,000.00</b>

To continue to build technology integration capacity by acquiring interactive technologies and supporting equipment as determined by each building such as document cameras, interactive projection equipment, and tablets. Integrated technologies foster engagement and support flexible learning environments responsive to different student learning needs. *The decrease is based on saturation of some equipment (such as document cameras) and the multi-use capability of equipment such as iPads (replacing listening centers).*

Account to be distributed according to grades served:

Mastricola Elementary, Reeds Ferry and Thorntons Ferry	@ \$ 2,333	\$ 7,000
Mastricola Upper Elementary and Merrimack Middle	@ \$ 3,500	\$ 7,000
Merrimack High	@ \$ 7,000	<u>\$ 7,000</u>
	Total	\$21,000

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**OBJECT - Property/Library - (8700) continued**

**100-1148-48-8738-07 – Technology Infrastructure Improvement**

<b>2017-2018 Budgeted</b>	<b>\$ 235,560.00</b>
<b>2017-2018 Expended</b>	<b>\$ 235,779.88</b>
<b>2018-2019 Budgeted</b>	<b>\$ 291,920.00</b>
<b>2019-2020 Proposed</b>	<b>\$ 332,170.00</b>

1	Additional Network Cabling	\$30,000.00
2	Network switch upgrades	\$6,000.00
3	Storage Area Network Upgrade	\$60,000.00
4	Server Upgrades	\$10,000.00
5	WiFi expansion	\$10,000.00
6	Expand/update computers	\$172,170.00
7	Classroom projector installs and replacements	\$15,000.00
8	STEAM education equipment	\$15,000.00
9	VOIP phone system maintenance	\$5,000.00
10	Paging system upgrades	\$8,000.00
11	Network/Telecom contracting	\$1,000.00
<b>TOTAL</b>		<b>\$332,170.00</b>

The Technology Capital Improvement Plan (CIP) continues to provide proactive and sustainable improvement of instructional and operational technology solutions and establishment of a regular and predictable budget process. Annual planning occurs in collaboration with district and building administration, instructional leaders and technology and library staff. The Technology CIP is divided into categories, which are further explained below:

1. Cabling upgrades continue to achieve increased district bandwidth (10/100/1000 mbps), to shorten too-long cable runs, replace aging cables, increase the bandwidth capability of wireless access points, and add more devices.
2. Replacement and addition of network switches continues to ensure all network jacks support gigabit connections and provide Power over Ethernet (PoE).
3. Storage Area Network (SAN) hardware that was purchased in 2009 with ARRA funds needs to be refreshed. This system houses virtual hosts and local data and continues the process of streamlining network operations.
4. Server upgrades continue to ensure schools have access to login and print services and that district-hosted services are supported.
5. In 2018-19 about two-thirds of classrooms will have an access point with 2019-20 being the final stage of the project.
6. Demand for student mobile computing continues to rise based on instructional and assessment needs. Mobile laptops support the new math program, Star360 and NH Statewide assessments, as well as research and an increasingly creative approach to instruction and demonstration of learning.

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7. Projector installs have reached nearly every classroom, but existing cabling / connections need to be upgraded and newer installations are shifting to interactive projectors. The district has begun to install integrated soundfield systems to replace freestanding soundfield systems and ensure computer/projected audio is incorporated. This comprehensive approach supports all learners, increases engagement, and reduces technical problems such as feedback and static.
8. STEAM education initiatives are growing and will continue to need technology supports such as robotics equipment, consumables and makerspace equipment.
9. The current VoIP phones are the slow point in wired connectivity. This line represents the initial shift to gigabit capable phones for classrooms where the computer connects through the phone.
10. School paging systems are old and core components and controller boards have been starting to fail. Proactive service and upgrades will prevent outages and downtime.
11. Ongoing contract support for operations such as network upgrades and major server projects.

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**OBJECT – Other Object (8800)**

**100-2221-36-8810-07 - Membership/Library**

<b>2017-2018 Budgeted</b>	\$ 1,350.00
<b>2017-2018 Expended</b>	\$ 1,673.40
<b>2018-2019 Budgeted</b>	\$ 1,350.00
<b>2019-2020 Proposed</b>	\$ 1,350.00 ✓

To maintain memberships in national and regional chapters of library and technology associations in support of school district goals and objectives.

**100-2221-36-8815-07 - Professional Meetings/Library**

<b>2017-2018 Budgeted</b>	\$ 500.00
<b>2017-2018 Expended</b>	\$ 486.94
<b>2018-2019 Budgeted</b>	\$ 500.00
<b>2019-2020 Proposed</b>	\$ 500.00 ✓

To provide funding for registration fees and other expenses associated with attending state, regional and national conferences related to school district goals and objectives.

## **Response to Board's Budget Message Regarding Technology**

### **Some Historical Information**

The Capital Improvement Plan for Technology has provided funds to improve technology infrastructure from the server closets to the classrooms. Recent improvements have included investments in:

- Server upgrades at the schools, SAU Office, and district server room (in MHS)
- Cabling to increase access to network jacks and replace older wiring with the current standard (Category 6)
- Wireless access points (APs) and installation (which includes cabling) as well as replacing APs with newer protocols and higher speed capabilities
- Classroom instructional technology. Nearly every classroom currently used for instruction has an installed projector and sound capability.
  - This changes with shifting use of space.
  - There are also large spaces where we need AV installations. These items have been requested but these are larger ticket items requiring separate planning and possible outside funding. For example, the MUES Smith Gym was paid for with Town Trustee support. The MUES APR audio system was funded by their parent group.
- Electrical panel replacements to support right-sized electrical for computers labs such as MHS 249 and 120
- Voice Over IP telephone system, which is now a district-wide system

Going forward starting with the 2019-2020 CIP budget there are five areas of priority focus and long range planning:

### **Servers**

The overall goal is to replace and consolidate servers. The Storage Area Network (SAN), originally purchased in 2009 with ARRA funds, will be replaced and used to run virtual hosts and district-based storage, including backups. Effective design of the host environment will reduce the number of standalone servers. Additionally, by purchasing a duplicate set of smaller, more efficient SAN units distributed between two sites, the environment will include a fully redundant backup of the other. Over the past several years, backup systems and procedures have been centralized and streamlined to reduce our chances for data loss.

- Future goals include researching out-of-district backup locations for locally managed data
  - PowerSchool, InfiniteVisions, Office365/Sharepoint, and several other critical systems are already backed-up offsite as part of their terms of service.

### Student and Staff computers

The ongoing demand is for more mobile devices. Laptops have a shorter life span than desktop computers, but district technicians work to prolong the length of all devices available for student use.

In 2019-2020 roughly 25 devices will be added at each PreK-4 elementary. Between the spring and fall of 2018, each school received replacement devices for their 2 laptop carts, 25-40 iPads, and TFS and RFS received additional laptops to bring the student to device ratio for the preK-4 schools into closer alignment. The preK-4 schools use a mix of iPads, Windows laptops, and Chromebooks and the staff at each site are integral to the planning for the purchasing of student devices. The 2 carts per school purchased in 2014-15 have all been replaced in 2018-19, but with a few small repairs and updated software, the older laptops have largely been able to be placed in classrooms for student use. As the older units fail they will be removed (not serviced).

In 2019-20 MUES will receive an additional 30 Chromebooks. During that year 60 laptops will be reviewed for replacement. If adding RAM and upgrading software improves performance, they will be placed in classrooms for student use and removed as they fail.

In 2019-20 MMS will receive an additional 30 devices. The first carts of student laptops were purchased in 2016-17, with an additional 60 devices added in 2018-19. No mobile devices will need to be replaced but the computer labs may need to be upgraded, depending on performance.

In 2019-20 MHS will receive an additional 30 machines and 120 laptops purchased in 2015-16 will be assessed for performance to determine if they can be serviced for longer life. MHS received 90 Chromebooks in 2018-19 which have proven to be very popular. Some of the 120 laptops might be candidates for Windows 10s, a browser-based windows operating system with better performance and easier management.

Following the above plans the student to mobile device ratios in 2019-20 will be:

	current mobile	machine add	End of life	19-20 mobile count	enrollment	student to device ratio
MES	206	25		231	400	1.7
RFS	214	25		239	500	2.1
TFS	199	25		224	500	2.2
MUES	270	30	30	270	550	2.0
MMS	185	30		215	600	2.8
MHS	333	30	120	243	1200	4.9
		165		1422		

**Networking**

Ongoing upgrading of cabling continues at MHS, MUES, and part of TFS. There are some areas with very long cable runs on older protocol wires (Category 5) and replacement will improve network performance and provide ongoing expansion capability. As cabling is replaced we update patch panels and network switches. Strategic decisions must be made regarding device replacement to support hard-wired connections against the goal of expanding wireless service.

**Addition and replacement of wireless APs**

In 2017-18 existing APs were moved from hallways (for broader coverage) into classrooms, which targets service and supports more devices in a given space. Enough APs were added to achieve roughly 1 for every 3 rooms.

In 2018-19 an additional 55 APs were installed so that APs are directly installed in approximately 75% of instructional spaces.

In 2019-20 the plan is to install roughly 70 APs to achieve 1 AP per classroom. There are additional APs placed on mobile device carts (to improve service), in administrative and meeting areas, gymnasiums, cafeterias and other areas of common use.

**Additional Equipment**

This account is used for non-installed instructional equipment. This category has undergone a shift in purpose due to changes in technology. For example overhead projectors have been replaced by document cameras. Cassette/CD listening centers have been replaced by iPads, which can be used for many other purposes. Many teachers use Mimio Teach bars to make their whiteboards interactive. The Mimio Teach bars are portable devices that can move with the teacher (rather than integrated whiteboards). These are most heavily used in the PreK-4 schools. This account has provided teacher-use iPads, which they project, thereby creating interactive control of the projected image.

There are currently 221 document cameras, 81 MimioTeach bars, and over 100 teacher-designated iPads (as compared to those in carts for students, STEM, Title 1, or Special Education).

Additional types of requests include Osmo learning kits (used with iPads), SnapCircuits, and headphones (as more learning is done on devices).