



Information & Technology Plan 2014-19

January 27

Vision for Madison Schools

Every school will be a **thriving school** that prepares every student to graduate from high school **college, career, and community ready.**



Technology in service of learning

- To accomplish our vision, we are focused on great teaching and learning.
- Technology is an essential instructional tool to enhance learning.
- We believe in equal access to technology for all
- Students need technology and digital literacy skills to be college, career and community ready.



Highlights of the Tech Plan

Devices available to all students when needed to personalize learning and increase digital literacy

Resources for staff that will strengthen high-quality instruction

Flexible learning spaces for discovery, collaboration, and creation

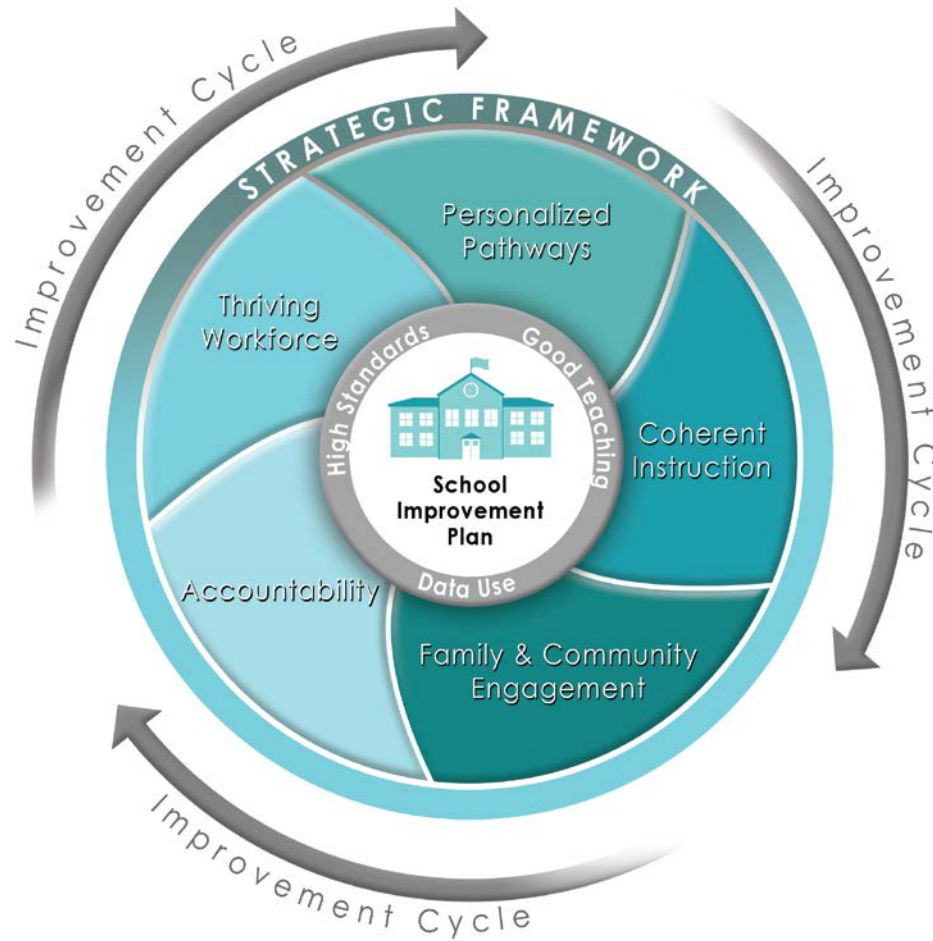
Upgraded infrastructure for fast, reliable systems

Improved data systems to help tailor learning based on students' needs

Professional learning to engage staff in ongoing learning around instructional technology

Thoughtful implementation designed for continual learning and adjustment

Theory of Change



Five Priority Areas



Coherent Instruction



Personalized Pathways



**Family and Community
Engagement**



Thriving Workforce



Accountability

Thank you for your feedback

Adjustments from the draft:

- *Vision* – additional discussion of **research base and MMSD context**
- *Student Computing* – modified ratio in **K-1 to two-to-one** devices and discussion of appropriate use and screen time
- *School Learning Spaces* – additional discussion of **advanced coursework opportunities** for secondary students
- *Professional Learning* – **more discussion and funding for opportunities for staff**, including a mixture of summer/school year and school day/after school
- *Support for All* – clarification around **staffing levels, student intern program, and the development of school tech teams** as strategies



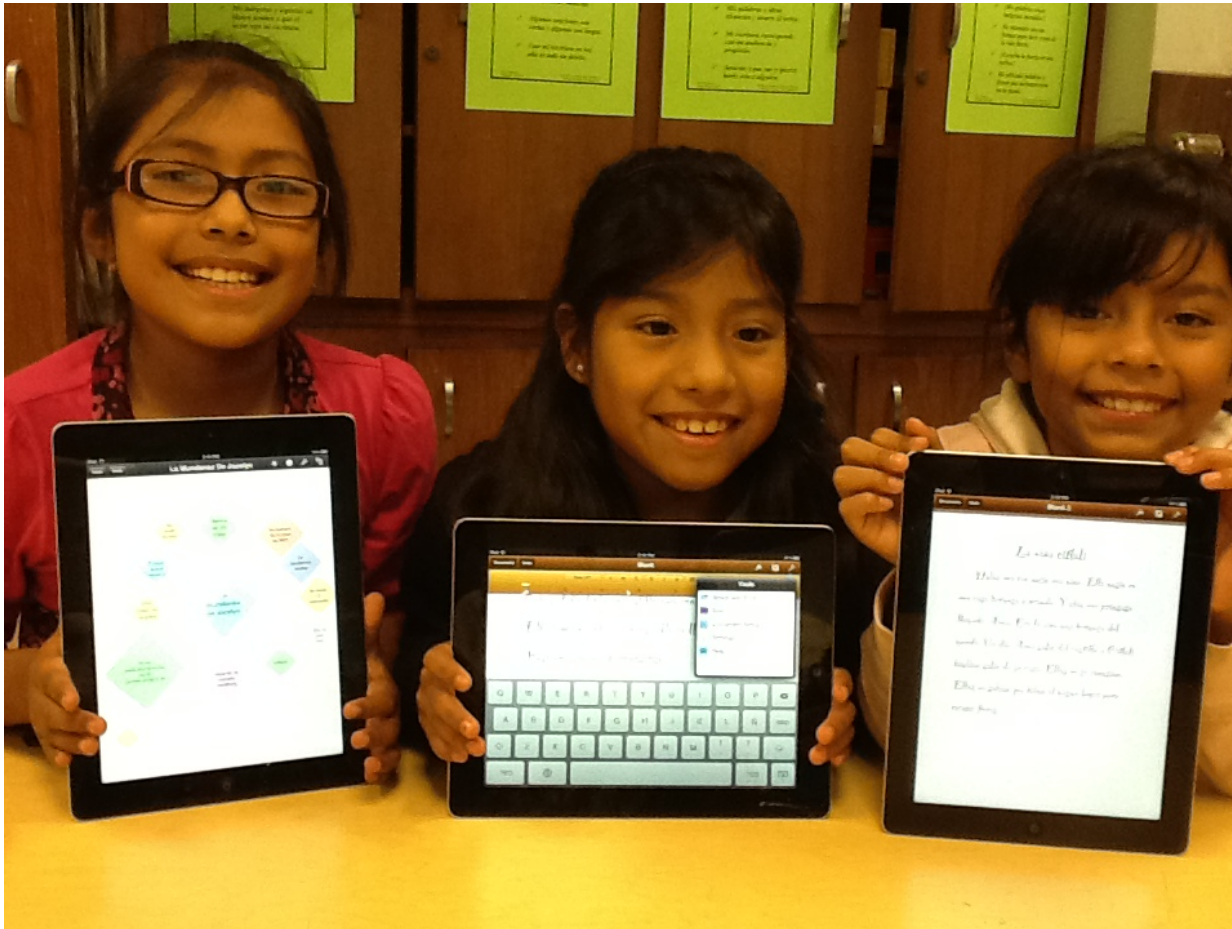
Changes to Projected Budget

- *Student Computing* - changed K-1 to two-to-one devices
- *Staff Computing* – firmed up existing device inventory for teachers to refine projected costs
- *Professional Learning* – added more funding for staff development
- *Overall* – engaged in further conversations with potential vendors to lower lease estimates

Total Change - \$3.3 million decrease in five-year budget



Sandburg Elementary



Questions?



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January 2014

mmsd.org/techplan





Information & Technology Plan

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Executive Summary

MMSD is intensely focused on ensuring that every school is a thriving school that prepares every student for college, career and community. The MMSD Information & Technology Plan sets the vision for technology use in the district over the next five years. We know that the day-to-day work of great teaching and learning in every classroom is what gets results for all students. Innovative technology use is crucial for the best possible instruction. Crafted through research and best practice review, with input from key stakeholders and technology experts, our vision for technology in the district is:

Technology will empower students, staff and families to engage in continuous learning through discovery, collaboration and creation. Accessible, flexible and differentiated technology for every student at every school with ongoing professional learning for staff and support for families will strengthen high-quality instruction and personalize learning to allow every student to graduate college, career and community ready.

To achieve our vision for technology, we will focus on several projects:

1. **Student computing** – We will ensure that every student has access to a computing device when they need it with devices and policies differentiated by level and learner needs, to ensure access to information, increased collaboration, and multiple forms of student expression of learning.
2. **Staff computing** – We will provide all staff with the appropriate technology needed for high quality planning, instruction, and data use, as well as collaborative learning, including mobile computing for teachers and school administrators.
3. **School learning spaces** – We will create learning spaces that work for individual, small group, and large group instruction, and equip them with the right technology for collaborative projects and creative problem solving.
4. **Networks and servers** – We will upgrade our networks and servers so that students and staff can access resources when and where they need them.
5. **Student information systems** – We will improve our student data systems to help students and staff tailor learning based on students' strengths and needs.
6. **Professional learning for staff** – We will implement ongoing, relevant, and collaborative professional learning for staff around instructional technology.
7. **Support for all** – We will provide students, staff, and families with high-quality technical support and strategies for authentic engagement.

The plan includes deliberate preparation, implementation, and monitoring phases to ensure each project's success. By phasing in projects strategically over five years, we can learn from each other and from emerging best practices, build on our successes, spread out up-front costs, and address key challenges that arise. We will also track implementation metrics so we know how the plan is serving our students, staff, and families. Thoughtful and innovative use of technology is a key tool for our district as we stay focused on providing the very best instruction to every student. For more information, visit mmsd.org/techplan and continue to stay involved in this exciting project.





Vision for Information & Technology

As Superintendent Cheatham conducted dozens of meetings with students, staff, and community members during her entry phase, it became clear that a lack of equitable access to technology was a concern among students, staff and families. Technology is a powerful tool for transforming education and meeting students' needs in creative, innovative, and flexible ways.

To develop the Information & Technology Plan, the district reviewed research, surveyed best practices from districts across the country, and held nearly 30 input and feedback sessions with students, families, staff, technology experts, and digital media in education faculty from the University of Wisconsin-Madison. This work helped develop and refine our vision for technology in MMSD:

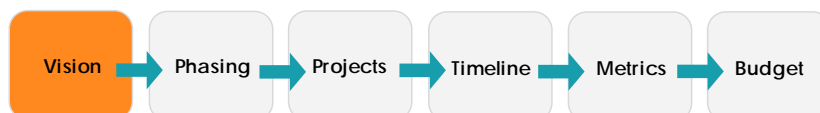
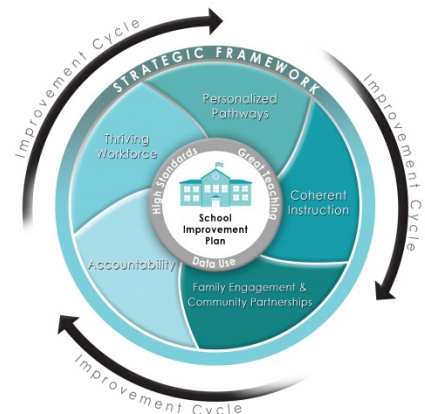
Technology will empower students, staff, and families to engage in continuous learning through discovery, collaboration, and creation. Accessible, flexible, and differentiated technology for every student at every school with ongoing professional learning for staff and support for families will strengthen high-quality instruction and personalize learning to allow every student to graduate college, career, and community ready.

The MMSD Strategic Framework presents the vision that every school will be a thriving school that prepares every student to graduate from high school college, career and community ready. Innovative use of technology can help accomplish that vision in two ways.

Digital literacy is the ability to use technology strategically to find and evaluate information, connect and collaborate with others, and produce and share original content.

College, career and community ready means having the skills necessary to succeed after high school, including digital literacy. Across the country, school districts, postsecondary education institutions, and industry leaders are recognizing the importance of these skills to prepare students to enter the 21st century workforce. For our students to graduate ready to compete in this global economy, we must equip them with these skills in the classroom.

As a district, we are incredibly focused on great teaching and learning – because we know that is what will get the best results for all students. Technology is an important tool for making that teaching and learning the best it can be. It can help ensure all students have access to a challenging education and aid teachers in planning using the Common Core State Standards, use of the gradual release of responsibility to deliver instruction, and utilization of data to make adjustments to instruction based on student need (see Appendix for further discussion). Technology also affords endless opportunities for supporting diverse groups of students, personalization





of a student’s education, and exploration of college and career pathways. To help support great teaching, technology will make it easier for our staff to develop as professionals and will make it easier to attract and retain high-quality teachers.

Our vision includes classrooms and schools with technology that enables students to

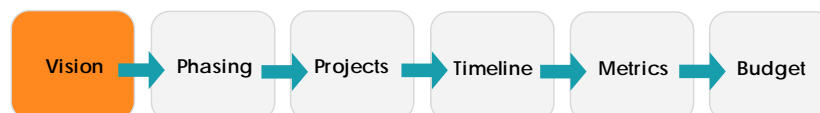
Makerspaces provide hands-on, creative ways to encourage students to design, experiment, build and invent. Industry leaders and higher education centers are among some of the groups supporting K-12 education and community groups with the resources and technology to create makerspaces, which help young people develop confidence, creativity, and spark an interest in science, technology, engineering, math, the arts, and learning

work collaboratively and creatively discover and create knowledge. Classrooms will have flexible digital resources to allow for innovative instruction and personalized learning. Schools will have comfortable and inviting shared spaces with dynamic layouts and exciting technological resources that serve as “makerspaces,” allowing our students to cooperate and create projects that would be impossible to create alone and without the resources we provide. Through technology and great teaching, the borders of the classroom and school will expand, opening up new frontiers for our students to collaborate and explore beyond the classroom.

As in the district’s overall vision, the vision for Information & Technology includes a particularly keen focus on equity across schools and access for all students, families, and staff. To make this happen, this vision includes having **a device available to every student** when needed. Research has highlighted the myriad benefits of one-to-one computing in education, including:

- *Student Achievement* – Students had higher achievement scores on standardized tests and GPAs in one-to-one schools. Impacts are particularly strong for reading and writing, where students in one-to-one programs had higher reading scores and higher quantity and quality of writing.
- *Student Engagement* – Students had higher attendance, fewer behavior referrals, and greater motivation and interest in school. Students with disabilities using one-to-one technology, for example, showed higher achievement, motivation, participation, and ability to work independently.
- *Cost Savings* – One-to-one schools save on copying costs, textbook costs, and energy costs. Other cost savings come from reduced disciplinary actions, providing online professional learning, and space saving through reducing computer labs (Stephens, 2014; Sauers & McLeod, 2012; Greaves, Hayes, Wilson, Gielkiak, & Peterson, 2012).

One-to-one computing is growing quickly, with hundreds of districts nationwide moving towards this model, with notable examples including Mooresville Graded School District in North Carolina, Sunnyside Unified School District in Arizona, and the Maine Learning Technology Initiative (Greaves et al., 2012). MMSD would join over 40 Wisconsin districts moving towards a one-to-one student computing environment. In a survey of Wisconsin school districts, we found that school districts like Waukesha and McFarland have begun to implement one-to-one computing, and others like Sun Prairie Area plan to implement it in the future. MMSD will be on the cutting edge of instructional technology use, making it a leader for the state.





Plan Development Process

MMSD has gathered research, best practices, and stakeholder input to guide our vision for technology use in the district. This work has involved staff from throughout the district in a variety of departments, from school-based staff, principals, and teachers, to central office staff in departments such as Curriculum & Assessment, Technical Services, Professional Learning and Leadership Development, and Research & Program Evaluation. In crafting the plan, we gathered information from a range of sources.

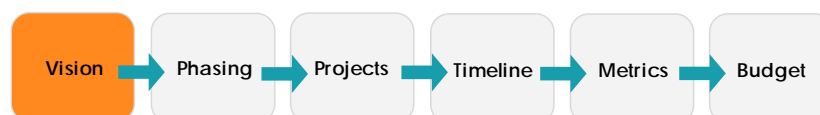
- A survey of more than 40 districts in the state of Wisconsin regarding their current and future technology plans, with follow-up conversation with select districts' technology staff;
- A national review of high-quality technology plans by Hanover Research Group, which identified six large districts (Roanoke, Forsyth, Fayette, Township, Northwest, and Prince William County) from five states with high quality technology plans as judged by the Center for Digital Education;
- A review of current research on educational technology, with a particular focus on what can enhance teaching and learning for students in districts with a similar student composition and local context as Madison; and
- Nearly 30 input and feedback sessions with students, families, staff, community experts, technology experts, and faculty from the University of Wisconsin-Madison, with findings synthesized in two reports by Hanover Research.

Through this work, MMSD arrived at a plan to ensure that every child has a device available when needed. The Research & Program Evaluation Office then reviewed additional studies and information from other districts that showed promising results in one-to-one computing. Taking into account the academic research and the review of other districts, we have examined hundreds of districts and their approach to technology – both districts that are one-to-one and those taking other approaches.

As all education research has shown, local context is critical. What works in one district isn't necessarily what works in another, but we have seen promising results here in Madison at schools like Sandburg Elementary and in individual classrooms throughout the district. Based on the needs of our students and community, we believe the research and experiences of other districts suggest that one-to-one can be transformative in Madison.

One-to-One at Sandburg Elementary

Teachers at Sandburg report tremendous success with one-to-one computing, which has helped them better serve a rapidly changing student population with a large number of English Language Learners. Sandburg has one-to-one tablets for grades 2-5 and tablets available for K-1. Through one-to-one technology, they have developed personally meaningful and engaging curriculum, encouraged new forms of collaboration, and taught digital literacy to augment their traditional literacy approach. This technology also has allowed them to store student work and instructional materials and record assessment information in new ways.





Goals

Technology will support all work throughout the district; as such, the work around the tech plan will be done in service of three goals outlined in the Strategic Framework:

1. Every student is **on-track to graduate** as measured by student growth and achievement at key milestones.
2. Every student has access to a **challenging and well-rounded education** as measured by programmatic access and participation data.
3. Every student, family and employee experiences a **customer service-oriented system** as measured by school climate survey data.



Key metrics for implementation of the plan are described later in this document.

Guiding Principles

In the Strategic Framework, the district defined core values and ways of working to ensure that the goals and priorities outlined in that plan can be achieved. In much the same way, this plan is built on guiding principles that outline how technology use supports the strategic framework and great teaching and learning for all students. These principles include:

- **Focus on teaching and learning** – Great teaching and learning drive all we do as a district, and technology will play an integral role in this work. Technology should support high-quality instruction, not drive it, and innovative resources will help our teachers and students do their very best work.
- **Alignment to the School Improvement Plans** – With schools as the driving force for all we do as a district, we know that spending on school-based resources must be a priority, and that technology integration must be included within the SIP and the critical work done by school-based leadership teams.
- **Flexibility within clear parameters** - To ensure consistency and equity across the district, clear parameters will be set around which resources we will purchase that can ensure equity, while still allowing for local decision-making about how to best implement these resources. To support this work, we will document how schools choose to implement differently so we can capture and share best practices across schools.
- **Collaboration** – Working with internal and external groups will be critical to the tech plan's success. The use of a steering committee, project-based cross-functional teams, and an advisory group that includes parents, students, and industry experts will ensure that decision-making considers the interests of all groups (see below for more information on these teams). To support the implementation of this plan, MMSD will forge additional partnerships with UW-Madison and other University of Wisconsin System schools, other area higher education organizations, other districts, and technology experts. In addition, we



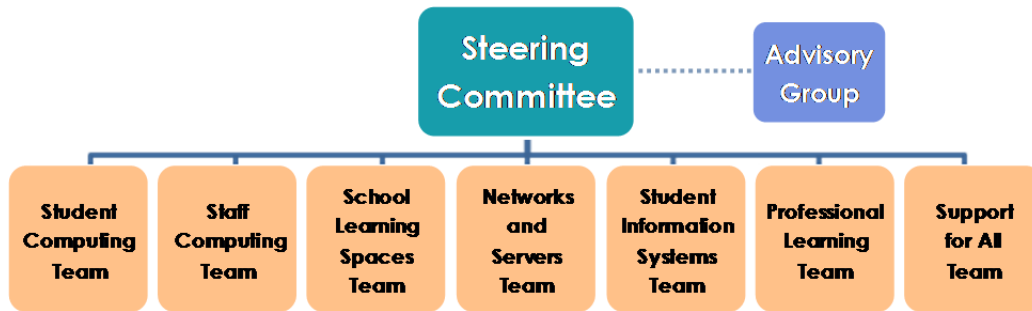


must plan for confronting the digital divide that exists in Madison (i.e., the divide between individuals and communities that do and do not have access to information technologies), which will include working with the City of Madison and private sector technology leaders to provide internet access in more neighborhoods and in more community gathering spaces.

- **Phased approach to implementation** – To ensure success, the projects within this plan are phased in over time. Phasing in recommendations makes the challenges of implementing a one-to-one computing program manageable, allows for intentional planning time for students and staff, and allowing the district to support all users of technology comprehensively so the tech plan is an exciting extension of existing work.

Team Structure

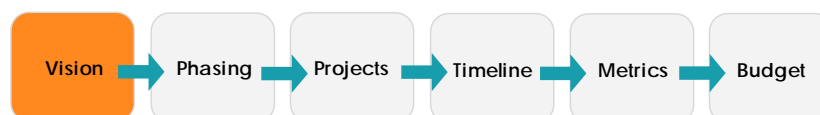
The graphic below shows the teams involved in the implementation of the tech plan.



The **steering committee** includes key internal actors in the district, including the Superintendent, Chief of Staff, Assistant Superintendent for Teaching and Learning, Chief Information Officer, Director of Technical Services, Director of Professional Development, and Program Evaluation Specialist. This group guides the overall development and implementation of the plan, heads the project-based teams, selects schools for phasing of projects, informs and incorporates ideas from the advisory group, and is responsible for publicly reporting on the plan’s progress.

The **advisory group** will include a representative from key stakeholder groups both internal and external to MMSD, including teachers, principals, parents, students, community members, and industry experts. This group will provide guidance to the steering committee on key issues.

Meanwhile, the project-based **cross-functional teams** will consist of MMSD employees, with each team headed by a member of the steering committee. Composition of these teams will vary, with representation from various departments throughout MMSD such as Technical Services, Curriculum & Assessment, Professional Learning and Leadership Development, Multilingual and Global Education, Talented & Gifted, and Educational Services. School-based staff will also be members of these teams, including principals, teachers, and support staff. These teams will work on the details of each project in the plan.





Phasing

Research has shown that for a district to be successful in technology integration, it must provide appropriate planning and support over time. For several major projects – including student computing, staff computing, school learning spaces, and professional learning for staff – the district will use a phased approach to implementation, which will focus on three stages:



- 1. Prepare** – Schools and Central Office work together to prepare for implementation of devices and support, including purchasing hardware, loading software, adapting devices to meet student needs, and providing professional learning to staff on how to integrate the device into high-quality instruction.
- 2. Implement** – Schools and Central Office staff work together to deploy devices, provide intensive professional learning around instructional technology, and put school-based systems in place to support technology use.
- 3. Monitor** – Schools continue use of instructional technology with support as needed from Central Office.

The graphic to the right illustrates how phased projects move through the stages:

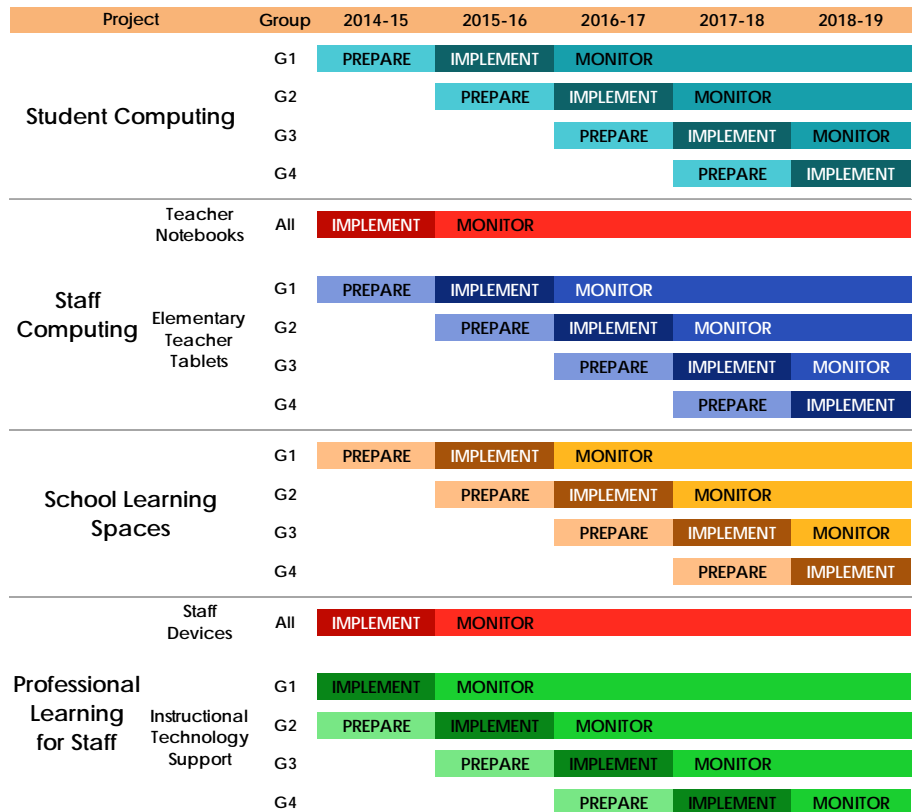
The first group of schools (**G1**) to receive new resources, in 2015-16, will include four schools: two elementary schools, one middle school, and one high school, with one school selected in each high school attendance area. The remaining schools will be divided into three groups (**G2-G4**), with one group receiving new resources each year through 2018-19.

Throughout the plan, we will learn as we go and change phasing plans as needed.

The steering committee will determine which schools fall into which group in Spring 2014.

Groups will be selected based on a set of criteria including academic needs, student demographics, family input, existing resources, content of School Improvement Plan (SIP), and feeder patterns.

For other projects, such as network upgrades, student information systems, and technical and family engagement support, we will implement recommendations beginning in 2014-15. These components provide the necessary backbone to make the one-to-one computing initiative successful.





Projects

For the district to achieve this vision and goals for technology, we need to put the appropriate physical infrastructure and user support in place over the next five years. The major projects include student computing, staff computing, school learning spaces, networks and servers, student information systems, professional learning for staff, and support for all.

Student Computing

By 2018-19, MMSD students will have a device available when they need it. In grades 2-12, students will have **one-to-one computing**, which means each student will have access to a wireless computing device. Students in kindergarten and first grade will have computing access at a two-to-one ratio.

In kindergarten and first grade, each classroom will have a charging station for 10 tablets. These tablets can be shared with another classroom when needed to offer access to every student in a class at the same time.

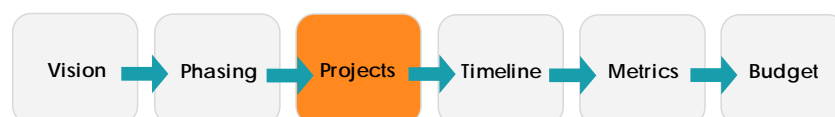
In grades 2-5, all students will be provided with a tablet computing device. Students in grades 3-5 will be supplied with a tablet keyboard cover, which is necessary given the addition of keyboarding curriculum in grade 3 and the use of keyboards on computer-based assessments. Throughout K-5, tablets will be kept on charging carts in each classroom and used during school hours. Secondary students in grades 6-12 will be provided with a notebook device that they can bring home with them as they progress through the grades. Transitioning from tablets to notebook in the secondary schools will allow students to focus on writing, use more advanced collaborative applications such as Google Docs and Google apps, and access and create learning games to learn principles of design and coding.

“We can only achieve the kind of engagement, student-centered learning, and real-time data and information needed to transform our school system by providing seamless universal access for every child. Students with ready access to technology evolve from passive to active learners who take on more responsibility, act as experts, and become more engaged in their own learning.”

-Transforming Learning with Technology, 2013

There is substantial evidence that one-to-one computing can produce gains in engagement and achievement across disciplines (Sauers & McLeod, 2012). At earlier grades, the research base on the effectiveness of one-to-one computing is more limited, but MMSD elementary schools using one-to-one report tremendous results even for the youngest students.

All student devices will come loaded with the appropriate software to enhance learning and support existing curriculum. The district will provide digital resources for learning, including e-textbooks, e-learning resources, and educational software and





applications. Although we will increase the availability of e-textbooks, hard copy textbooks will still be available as needed. For students with disabilities, the Division of Special Education will continue to provide students with the assistive technology (i.e., devices used to increase, maintain, or improve the functional capabilities of a child) and accessible instructional materials (i.e., specialized or alternative formats, including audio, digital, Braille or large print text) for those students who require these resources, either as adaptations to the student’s computing device or additional hardware. Device adaptation will also facilitates the implementation of Multi-Tiered Systems of Support (MTSS), including supporting services for diverse student groups like English Language Learners, students with disabilities, and advanced learners.

Phasing for the implementation of one-to-one student computing will follow the timeline below (for more information on phasing, see the Phasing section):

Group	2014-15	2015-16	2016-17	2017-18	2018-19
G1	PREPARE	IMPLEMENT	MONITOR		
G2		PREPARE	IMPLEMENT	MONITOR	
G3			PREPARE	IMPLEMENT	MONITOR
G4				PREPARE	IMPLEMENT

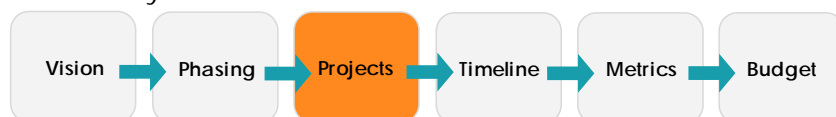
The Student Computing cross-functional team will advise on device selection and various policies and practices. Issues include students’ ability to take devices home, screen time, students bringing their own devices (BYOD), filters and privacy settings, appropriate and responsible use, and customization of devices. Policies will be differentiated based on student level (e.g., grades K-2, 3-5, 6-8, and 9-12).

The cross-functional team will pay particular attention to the amount of time children spend using technology, especially for younger students. The availability of student devices does not mean that these devices will be utilized by all students at all times; instead, it means that they are available when needed to allow seamless integration of technology into instruction when appropriate. In kindergarten and first grade, the two-to-one device ratio ensures that students cannot access a personal device at all times and puts a natural cap on time spent in front of a screen. Screen time will be closely monitored throughout the course of the plan.

Since one-to-one computing will not be initially available at all schools, the district will supply schools with notebooks and student headphones for use with online assessments. This short-term plan will create suitable testing environments for students to do their best work until full one-to-one implementation. Notebooks purchased for assessment can be used for non-assessment purposes, expanding the computing capacity of all schools from the beginning of the plan.

Staff Computing

MMSD will provide every staff member with the appropriate technology to do their work effectively and efficiently. Teachers and administrators will receive a notebook so they





are able to do their work flexibly. Teachers and administrators will need to receive the new technology during the 2014-15 school year. The Wisconsin Department of Public Instruction will implement the Educator Effectiveness system statewide in 2014-15 and administrators and teachers will need to be able to interface with the online system. This system will use an online tool to capture notes, video, and other evidence that is used to support professional learning and evaluations (Wisconsin Department of Public Instruction, 2013). Teachers at elementary schools will also receive a tablet computer so they can craft instruction that best fits their students' devices. Better technology infrastructure will make it easier for staff to grow as professionals; increase the attractiveness of the district to recruit and retain high-quality staff; and allow continuing emphasis on using student data to drive decision-making.

Phasing for the implementation of staff computing will follow the timeline below (for more information on phasing, see the Phasing section):

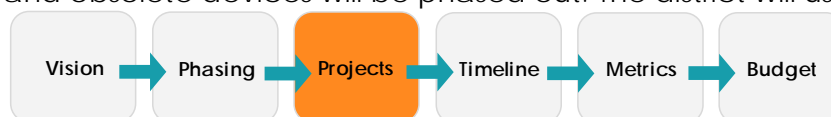
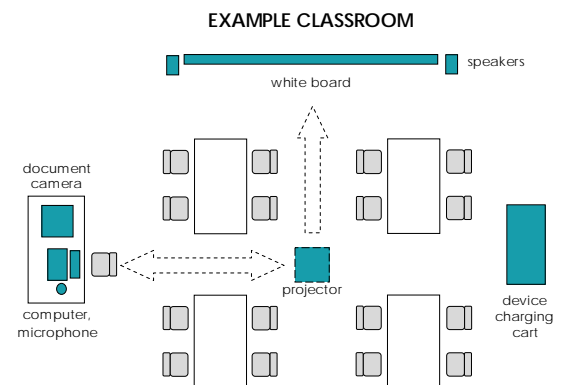
Project	Group	2014-15	2015-16	2016-17	2017-18	2018-19
Teacher Notebooks	All	IMPLEMENT	MONITOR			
	G1	PREPARE	IMPLEMENT	MONITOR		
Elementary Teacher Tablets	G2		PREPARE	IMPLEMENT	MONITOR	
	G3			PREPARE	IMPLEMENT	MONITOR
	G4				PREPARE	IMPLEMENT

Deployment of technology for other staff members - such as Central Office staff - will depend on the needs of their position. All devices will have productivity software loaded that meets the needs of their position. A replacement schedule will be established for staff technology to ensure that contemporary hardware and software will be available for staff to use.

School Learning Spaces

MMSD schools need flexible spaces that can be used for individual, small group, and large group instruction. Beyond personal computing, schools need shared learning spaces that will facilitate teaching and participatory learning, including classrooms, library media centers, and computer labs.

Each classroom will receive an interactive projection device paired with a white board, document camera, microphone, speakers, and software that will allow the teacher and students to project images from their device. These compatible devices will promote interaction, collaboration, and sharing information among the class. A computer will remain in each classroom for the teacher to use as the primary classroom computing device so that it will remain connected to the projector, document camera, and speakers. Old and obsolete devices will be phased out. The district will use existing





resources to fulfill the desktop computing needs in each room, and no additional resources will be needed. Equipping every classroom with these resources will create an environment that supports instruction and best meets the needs of every student.

The district will also update **library media centers** to create inviting, flexible spaces with up-to-date digital audio/visual hardware. Our libraries are ideally positioned to serve as makerspaces where collaboration and creation is centered around technology, allowing students to produce things together that will be impossible alone and without the right resources (Colegrove, 2013). Digital resources – such as the recently purchased OverDrive System, the first comprehensive, district-wide digital library system – are an essential part of a modern school library that allows access to quality digital resources at all times. Virtual access expands the capacity to deliver resources in a variety of formats and languages essential for today’s learners.

“Online learning environments... [provide] opportunities for greater collaboration while equipping students with stronger digital skills.”
-NMC Horizon Report

In secondary schools, the district will work to develop **virtual learning spaces**. These spaces will be classrooms where students and staff can access virtual learning environments, where teachers and students can interact in coursework with others outside of their building to take advanced coursework and even obtain college credit. To make this happen, rooms must be equipped with the proper technology, such as webcams, microphones, and speakers. An audit of existing space and upgrading

resources will make these learning spaces possible in our secondary schools. These rooms will facilitate the expansion of current offerings, more opportunities for dual-credit coursework in a virtual setting, and enhanced utilization of Wisconsin e-School Network resources.

Even with one-to-one computing, there will continue to be a need to maintain **computer labs**. Each middle school and high school needs computer labs that are used as a classroom for subject area instruction such as business education, technical education, and art. In addition, instructional departments will need specialized devices or software to use in their particular courses. Examples include science measurement devices and tools; technical education and art software (AutoCAD and Adobe Creative Suite); and technical education hardware such as a 3D Printer.

Phasing for the implementation of school learning spaces will follow the timeline below (for more information on phasing, see the Phasing section):

Group	2014-15	2015-16	2016-17	2017-18	2018-19
G1	PREPARE	IMPLEMENT	MONITOR		
G2		PREPARE	IMPLEMENT	MONITOR	
G3			PREPARE	IMPLEMENT	MONITOR
G4				PREPARE	IMPLEMENT

Through these projects, we will pay special attention to the technology needed to allow access to advanced coursework for high school students. By allowing our high





school students to access high-level learning taking place outside of their school, we can meet students at their level in certain areas where they need a greater challenge than what is available locally. We can also allow access to more advanced placement and college coursework, helping students not only access appropriately challenging content, but earn college credit and certifications to jumpstart their life post-graduation.

Networks and Servers

In order to manage the significant number of computing devices, the district must invest money in upgrading networks and servers. These upgrades will provide all users reliable access to the Internet and district resources.

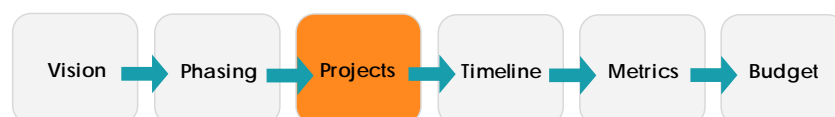
A **Wide Area Network (WAN)** is a system of high-speed fiber lines that connect every school to Central Office resources and the Internet. The district's WAN is a private fiber network called the Metropolitan Unified Fiber Network (MUFN). It will be necessary to purchase fiber communications equipment that will manage the flow of data at 10 Gigabits from every school. This will accommodate the significant increase in network devices and demand for more high speed applications that require more bandwidth and will meet our needs for the next ten years.

Each MMSD building has a **Local Area Network (LAN)** connected to the WAN. A LAN provides the connections to the computing devices in a school or building so they can access the Internet or access district resources. Upgrades will include a set of smaller switches that will need to be replaced in 2014-15 to provide 1 Gigabit connectivity across all MMSD building LANs. In subsequent years, LAN switches will need to be replaced over a two to three year period beginning in 2016-17. These switches will reach obsolescence in this time frame and a formal plan for replacement will be developed. The device that provides connectivity between the WAN and Local Area Networks (LANs) is called a core switch, which will need to be replaced during the first year of the Technology Plan.

The **wireless network** in each building will be analyzed and necessary adjustments to the wireless system will be made. To protect the wireless controllers - the devices that manage the access points - a redundant failover controller system will be installed during the first year of the Technology Plan. In the event that any controllers fail another secondary controller will take over without any loss in connectivity.

The **storage area network and virtual server system (SAN)** is the main storage system for all of the district's electronic files. The SAN is obsolete making parts unavailable and service is becoming more expensive. This system will be replaced in the next year under a four-year lease. Additionally, we will analyze other standalone servers to develop a plan for their replacement.

To ensure that our networks and storages are as safe and secure as possible, MMSD will explore security monitoring solutions and conduct a risk assessment and cyber threat assessment for all elements of the tech plan.





Student Information Systems

To better support data-based decision making, the district must maximize the utility and accuracy of its student information systems. These systems help us advance a personalized education system and identify individual needs through better learning analytics (NMC Horizon Report, 2013). The systems include Infinite Campus (IC), the primary source of data for all of the district's students; data systems for students receiving special education services; the MMSD Data Dashboard; and the infrastructure to create electronic Individual Learning Plans. Specific projects include:

Individual Learning Plans (ILP) outline a clear, personalized pathway to graduation with frequent checkpoints along the way for every high school student in the district. As part of the Strategic Framework's Priority Area II: Personalized Pathways, the district plans to develop more specifics for ILPs over the 2013-14 school year.

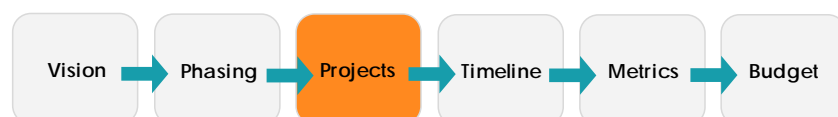
- Developing a more structured and managed approach to **Infinite Campus administration** and enhancing support to teachers, other staff including secretaries and schedulers, and parents;
- **Migrating of special education data** from outdated systems like GUI;
- Exploring alternative **progress monitoring tools** to replace the Student Intervention Monitoring System (SIMS);
- Developing a more proactive and cross-functional training approach for the **data dashboard**; and
- Identifying and implementing the appropriate hardware and operating systems with sufficient processing power, storage capacity, and management tools to operationalize the development of **electronic Individual Learning Plans (ILP)**.

Professional Learning for Staff

Just like good instruction, successful technology implementation requires high quality professional learning. Research and stakeholder input suggest that teacher professional learning is crucial to the effective use of technology to enhance teaching and student learning (Greaves et al., 2012; Hanover Research Council, 2013). A comprehensive professional learning approach around instructional technology will be integrated into the three common learning areas outlined in the Strategic Framework:

- Understanding and implementing the Common Core State Standards
- Defining and putting into use a set of essential instructional practices that align to the Danielson Framework
- Ensuring effective and regular data use

Technology use will support work in each of these areas, so professional learning will be closely integrated into the existing learning at the school and district level. For more information on how instructional technology will be integrated into essential instructional practices like gradual release of responsibility, see the Appendix.





Phasing for the implementation of professional learning will follow the timeline below (for more information on phasing, see the Phasing section):

Project	Group	2014-15	2015-16	2016-17	2017-18	2018-19
Staff Devices	All	IMPLEMENT	MONITOR			
	G1	IMPLEMENT	MONITOR			
Instructional Technology Support	G2	PREPARE	IMPLEMENT	MONITOR		
	G3		PREPARE	IMPLEMENT	MONITOR	
	G4			PREPARE	IMPLEMENT	MONITOR

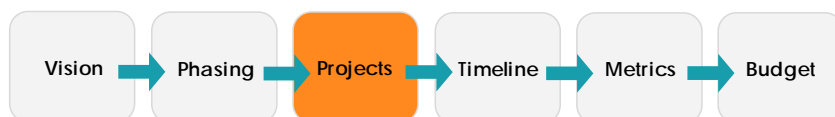
Through a comprehensive approach to instructional technology professional learning, teachers will have substantial time to engage in professional learning.

The majority of professional learning will occur at school sites and be a central part of each school’s School Improvement Plan (SIP). Schools will have flexibility to determine how time is used and which resources are committed to instructional technology. During contract hours, teacher learning will occur during District PD Days, staff meetings, selected early release days, and coaching sessions. Schools also will receive additional funding for professional learning. This funding can be used for substitutes during contract hours or to pay teachers extended employment during non-contract hours. For example, a successful professional learning model has been to find time for teachers to collectively watch and discuss the classroom practices of a colleague or an outside expert who teaches their students.

“ All too often, when schools mandate the use of a specific technology, teachers are left without the tools (and often skills) to effectively integrate the new capabilities into their teaching methods... ongoing professional development needs to be valued and integrated in the culture of the schools.”
-NMC Horizon Report

As another important aspect of this comprehensive professional learning approach, MMSD will offer **optional, non-contract professional learning opportunities during summers and on select weekends, through face-to-face, online, or “flipped” professional development venues.** Participants can receive either Professional Advancement Credits (PACs) or pay for reduced tuition rate academic credits. Some professional development opportunities also will offer extended employment. Finally, MMSD will find, develop, and share videos of instructional technology practices for teachers to watch for self-guided professional learning.

To make this system of effective professional learning a reality throughout these phases, several key positions and resources are necessary. One vital new position is a central office **instructional technology coordinator**. This person will provide and coordinate central office instructional technology support and professional learning. In addition, the district will add **four central office instructional technology coaches** who will play a critical role in site-based support through staff development, team support, employee group professional development (e.g., instructional coaches), Library Media Specialist coaching, summer/workshop professional development, and developing resources for families.





Additionally, each school will have at least one position that has a substantial role in planning and providing instructional technology professional learning. To support this work, we will transition the Library Media Specialist (LMS) role into the **Library Media Technology Specialist (LMTS)** role. The LMTS will co-plan, co-teach, and provide instructional technology coaching.

The school LMTS will:

- Participate in ongoing district professional learning
- Collaborate with teachers to provide a school-wide perspective and expertise in curriculum, standards, technology, and student outcomes;
- Co-teach and co-plan lessons around instructional technology and provide instructional technology coaching; and
- Help teachers and students become information and technology literate, as well as ethical and safe digital citizens.

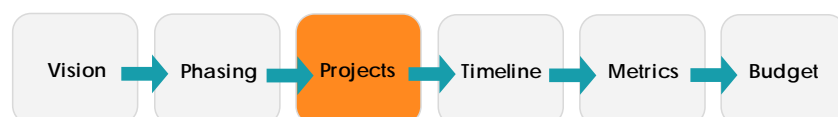
Support for All

The scope of the tech plan will necessitate a **high level of technical support** throughout the implementation process, and one-to-one computing will change the types of technical support that will be needed in the schools. While the type of support will change, the plan does not outline additional Technical Services staff. The possible need for additional staff will be closely monitored throughout the plan. After evaluating that need, we will make additional recommendations for staff as appropriate.

We would also like to establish a **student technical support** internship program, if possible, allowing students to gain hands-on experience for credit. These students would not replace or be a substitute for additional micro-tech staffing; instead, they will receive real world training while giving additional school-based support to students and staff. Engaging students in this way is an innovative practice that has been successful elsewhere (Corn, Oliver, Hess, Halstead, Argueta, Patel, Tingen, & Huff, 2010).

Another practice that has proven successful in MMSD schools already using one-to-one computing is the creation of a **school technology team**. Each school can create a technology team to help provide on-site support to staff and to keep instructional technology as aligned to the SIP at the forefront of school planning. With members representing various roles in the school, these teams can support seamless technology integration whenever and wherever it is needed.

As we plan to deploy new technology to all students, it is critical to use this opportunity to **enhance the connection between families and schools**. A communication plan for families will be developed to provide timely information on technology deployment to students. We must specify and clarify the functionality and use of the technology provided to students, especially for those families with limited experience using technology in their home or at work. Orientation at enrollment days, for example, will provide an excellent opportunity to jumpstart this discussion. The Department of Family and Community Engagement (FACE) will work with instructional technology leaders and schools staff to develop a plan for our families to ensure that they are informed and engaged in this major project.





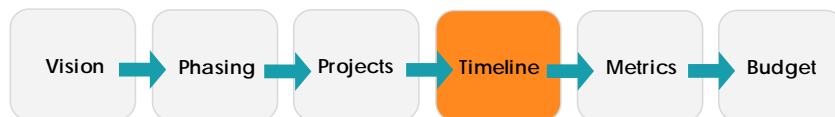
Timeline

The grid below outlines the yearly timeline for projects with this plan. When appropriate, projects are broken down by the school groups for implementation (G1-G4). Throughout the plan, we will learn as we go and adjust timelines as needed.

School Groups for Implementation:

- Group 1 (G1): 2 Elementary Schools, 1 Middle School, 1 High School
- Group 2 (G2): 10 Elementary Schools, 4 Middle Schools, 2 High Schools & Alternative Programs
- Group 3 (G3): 10 Elementary Schools, 4 Middle Schools, 1 High School
- Group 4 (G4): 10 Elementary Schools, 3 Middle Schools, 1 High School

Project	2014-15	2015-16	2016-17	2017-18	2018-19
Student Computing	Prepare to implement in G1 schools, including purchasing hardware, loading software, and adapting devices	Implement in G1 schools; prepare to implement in G2 schools	Implement in G2 schools; prepare to implement in G3 schools	Implement in G3 schools; prepare to implement in G4 schools	Implement in G4 schools; begin 3-year device replacement cycle
Staff Computing	Implement notebooks for all teachers and school administrators; implement tablets for teachers in G1 elementary schools; audit additional staff computing resources	Implement tablets for teachers in G2 elementary schools; maintain and replace teacher/staff devices as needed	Implement tablets for teachers in G3 elementary schools; maintain and replace teacher/staff devices as needed	Implement tablets for teachers in G4 elementary schools; maintain and replace teacher/staff devices as needed	Maintain and replace devices as needed
School Learning Spaces	Audit of existing classroom resources, libraries, virtual learning spaces, computer labs; identify needs and prepare purchasing plan for G1 schools	Implement resources to G1 schools; prepare to implement in G2 schools	Implement resources to G2 schools; prepare to implement to G3 schools	Implement resources to G3 schools; prepare to implement to G4 schools;	Implement resources to G4 schools; begin replacement cycle for shared resources
Networks and Servers	Finalize network upgrades (WAN, LAN, Wireless); replace SAN server	Manage and maintain servers and WAN; finalize remaining upgrades to wireless; plan to replace LAN switches	Manage and maintain servers, WAN, and wireless; replace LAN switches	Manage and maintain servers, WAN, and wireless; replace LAN switches	Manage and maintain servers, WAN, and wireless; replace LAN switches
Student Information Systems	Review existing systems and develop plan to improve and streamline; determine needs for ILP system	Implement and monitor improvement plan; implement ILP back-end infrastructure	Implement and monitor improvement plan; maintain and monitor ILP infrastructure	Implement and monitor improvement plan; maintain and monitor ILP infrastructure	Implement and monitor improvement plan; maintain and monitor ILP infrastructure
Professional Learning for Staff	Hire Instructional Technology Coordinator and 4 coaches; implement professional learning support for teachers' mobile devices; prepare professional learning around instructional technology for G1 schools; prepare for LMTS transition	Implement professional learning support for teachers' mobile devices; implement professional learning around instructional technology for G1 & G2 schools; implement LMTS transition for G1 schools	Monitor professional learning support for teachers' mobile devices; implement professional learning around instructional technology for G1-G3 schools; implement LMTS transition for G2 schools	Monitor professional learning support for teachers' mobile devices; implement professional learning around instructional technology for G1-G4 schools; implement LMTS transition for G3 schools	Monitor professional learning support for teachers' mobile devices; implement professional learning around instructional technology for all schools; implement LMTS transition for G4 schools
Support for All	Provide technical support for staff devices; implement family support strategies for G1 schools	Provide technical support for student and staff devices; implement family support strategies for G1 & G2 schools	Provide technical support for student and staff devices; implement family support strategies for G1-G3 schools	Provide technical support for student and staff devices; implement family support strategies for G1-G4 schools	Provide technical support for student and staff devices; continue family support strategies for all schools





Metrics

As a district, we are intensely focused on great teaching and learning – because we know that is what will get the best results for all students. Technology will support this important work, and therefore support the goals and indicators outlined in the Strategic Framework. Because the tech plan supports the Strategic Framework, the goals of the tech plan are the goals of the Strategic Framework:

1. Every student is on-track to graduate as measured by student growth and achievement at key milestones.
2. Every student has access to a challenging and well-rounded education as measured by programmatic access and participation data.
3. Every student, family and employee experiences a customer service-oriented school system as measured by school climate survey data.

Technology is not a program or initiative, but rather a way to support our essential work; as such, technology will be considered as part of a holistic review of the district's progress on our goals and indicators of success. In addition, we will measure our progress on implementation of the tech plan through a series of implementation metrics. These metrics are clear, intuitive, and easy to track so we can focus our efforts on serving students as well as possible rather than on collecting new types of data. Metrics relate to each of the seven major projects.

Student Computing

- Percent of students with devices
- Digital literacy survey

Staff Computing

- Percent of teachers with notebooks
- Percent of staff with up-to-date devices

School Learning Spaces

- Percent of classrooms with all tools outlined under School Learning Spaces
- Percent of libraries with up-to-date resources
- Percent of students participating in virtual learning

Networks and Servers

- Percent of connectivity upgrades completed
- Percent of buildings with 10 gigabit data flow
- Percent of buildings with LAN switches that can provide 1 gigabit connectivity

Student Information Systems

- Responses to parent and student climate surveys
- Attendance at data systems trainings
- Percent of students in grades 9-12 with ILP

Professional Learning

- Staff engagement with professional learning (attendance, satisfaction surveys)

Support for All

- Staff and parent surveys regarding quality of support

Progress on the tech plan and each metric will be tracked by Central Office staff and results will be embedded in the annual progress report on the Strategic Framework. We will consider other evaluation options as necessary and appropriate.



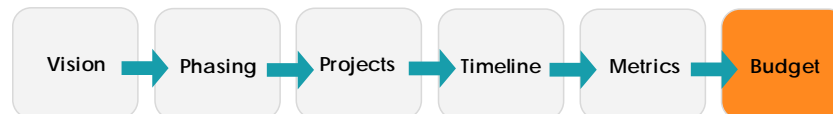
Budget Projections

This budget projections summary outlines each of the plan's seven major projects and ongoing work over the next five years. While the budget includes the best information currently, it is preliminary and will be finalized and approved by the board through the budget process each year.

Each project is broken into discrete sub-projects. This budget summary captures district-level spending on technology, regardless of department or fund source. It does not include costs for existing staff positions.

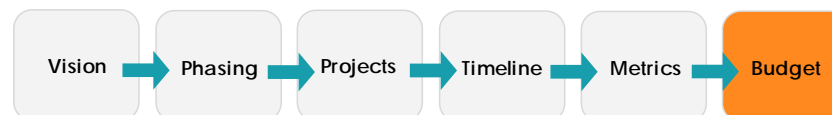
The budget increases **from \$1.5 million to \$3.9 million in the first year** to provide robust network infrastructure, ensure optimal school learning spaces, and provide one-to-one coverage for staff computing. Over the course of five years, the plan calls for a total of \$8.8 million for one-to-one devices for student computing. Following the five-year period covered by the plan, it is expected that district-wide spending on technology will level out to **\$6.4 million per year**.

Tech Services								
Description	Lease/ Purchase	2014-15	2015-16	2016-17	2017-18	2018-19	Fund Source	Continuing Budget
Student Computing								
Tablets - Elementary Schools (K-1 Classrooms 10 Tablets/Room, 2-5 Classrooms 1 Tablet per student)	Lease 3 Year		\$131,314	\$598,548	\$1,102,428	\$1,621,577	Tech Services	\$1,621,577
Keyboards and Covers for Elementary Tablets Grades 3-5	Purchase		\$39,280	\$133,680	\$133,520	\$164,720	Tech Services	\$40,000
Charging Carts - Elementary Tablets	Purchase		\$43,400	\$162,200	\$152,600	\$172,400	Tech Services	
Notebooks - Middle and Secondary Schools	Lease 3 Year		\$283,639	\$766,054	\$1,139,626	\$1,468,231	Tech Services	\$1,468,231
Charging Carts - Middle and High School Notebooks	Purchase		\$135,710	\$230,045	\$178,740	\$157,225	Tech Services	
Notebooks - Assessment	Lease 3 Year	\$172,950	\$172,950	\$172,950	\$172,950	\$172,950	Tech Services	\$172,950
Headphones - Assessment	Purchase	\$168,345	\$52,425	\$52,425	\$52,425	\$52,425	Tech Services	\$25,000



Budget Projections (continued)

Description	Lease/ Purchase	2014-15	2015-16	2016-17	2017-18	2018-19	Fund Source	Continuing Budget
Staff Computing								
Notebooks - All Teachers	Lease 3 Year	\$830,570	\$830,570	\$830,570	\$830,570	\$830,570	Tech Services	\$830,570
Tablets - Elementary Teachers	Lease 3 Year	\$9,655	\$57,063	\$102,310	\$148,277	\$148,277	Tech Services	\$148,277
Mobile Computer - School Administration	Lease 3 Year	\$27,685	\$27,685	\$27,685	\$27,685	\$27,685	Tech Services	\$27,865
Technology Replacement - All Office and Support Staff	Purchase	\$180,000	\$180,000	\$180,000	\$180,000	\$180,000	Tech Services	\$180,000
School Learning Spaces								
Classroom - Interactive Projector	Purchase	\$390,935	\$524,425	\$524,425	\$524,425	\$524,425	Tech Services	\$100,000
Classroom - Document Camera	Purchase	\$61,500	\$67,500	\$67,500	\$67,500	\$67,500	Tech Services	\$20,000
Classroom - Speakers/Microphones	Purchase	\$169,125	\$268,125	\$268,125	\$268,125	\$268,125	Tech Services	\$25,000
Classroom - Virtual Learning Spaces	Purchase		\$60,000	TBD	TBD	TBD	Tech Services	
Classroom - Computer Replacement	Purchase				\$150,000	\$150,000	Tech Services	\$250,000
Computer Labs - Replace 12 Secondary Labs/Year	Purchase	\$216,000	\$216,000	\$216,000	\$216,000	\$216,000	Tech Services	\$216,000
Specialized Technology - Secondary Curriculum Departments	Purchase	\$125,000	\$125,000	\$125,000	\$75,000	\$75,000	Tech Services	\$75,000
Networks and Servers								
WAN -MUFN Equipment	Purchase	\$250,000	\$75,000	\$75,000	\$75,000	\$75,000	Tech Services	\$75,000
LAN - Network Infrastructure	Purchase	\$350,000	\$250,000	\$150,000	\$150,000	\$150,000	Tech Services	\$150,000
Wireless Upgrade	Purchase	\$250,000	\$175,000	\$50,000	\$50,000	\$200,000	Tech Services	\$200,000
SAN - Virtual Servers & Servers	Lease 3 Year	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	Tech Services	\$150,000
Purchased Services	Purchase	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	Tech Services	\$50,000
Maintenance	Purchase	\$220,000	\$220,000	\$220,000	\$220,000	\$220,000	Tech Services	\$220,000

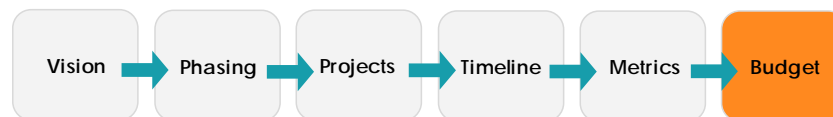


Budget Projections (continued)

Description	Lease/ Purchase	2014-15	2015-16	2016-17	2017-18	2018-19	Fund Source	Continuing Budget
Miscellaneous								
Software (e.g., ongoing licenses)	Purchase	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	Tech Services	\$250,000
Supplies	Purchase	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	Tech Services	\$50,000
Travel & Mileage	Purchase	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	Tech Services	\$20,000

Totals								
Total Tech Services Budget		\$3,941,765	\$4,455,086	\$5,472,517	\$6,434,871	\$7,462,110		\$6,365,470
Previous Year Budget		\$1,506,102	\$3,941,765	\$4,455,086	\$5,472,517	\$6,434,871		\$7,462,110
Change in Tech Services Budget		\$2,435,663	\$513,321	\$1,017,431	\$962,354	\$1,027,239		-\$1,096,640

Other Spending								
Description	Lease/ Purchase	2014-15	2015-16	2016-17	2017-18	2018-19	Fund Source	Continuing Budget
Student Computing								
Technology - Educational Services	Purchase	\$45,000	\$47,500	\$50,000	\$52,500	\$55,000	341 Flowthrough Grant	\$55,000
School Learning Spaces								
Library Media Centers - Technology for Student Use	Purchase	\$140,000	\$140,000	\$140,000	\$140,000	\$140,000	Common School Fund	\$140,000
Classroom - White Board	Purchase	\$82,000	\$90,000	\$90,000	\$90,000	\$90,000	Building Services	\$25,000
Professional Learning								
Instructional Technology Coordinator	Hire	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	TBD	\$90,000
Instructional Technology Coaches	Hire	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	TBD	\$300,000
Extended Contract PD Time for Each School	Schedule	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	TBD	\$200,000
Central Office-Provided Professional Development	Schedule	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	TBD	\$90,000
Totals								
Total Other Budget		\$947,000	\$957,500	\$960,000	\$962,500	\$965,000		\$900,000
Previous Year Budget			\$947,000	\$957,500	\$960,000	\$962,500		\$965,000
Change in Other Budget			\$10,500	\$2,500	\$2,500	\$2,500		-\$65,000





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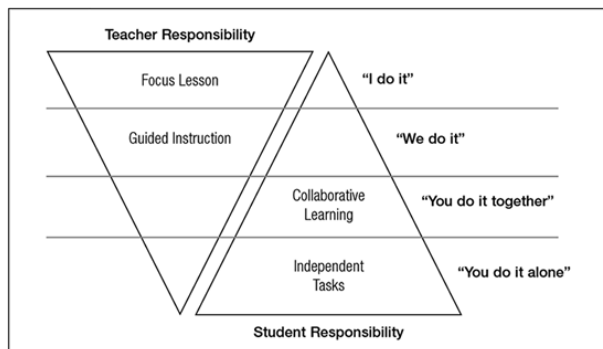




Appendix: Technology and Gradual Release of Responsibility Model

For our students to graduate college, career, and community ready, we must provide instruction that empowers them to become independent learners. The MMSD Strategic Framework outlines a focus on a set of great teaching practices that support the implementation of the Common Core State Standards, and include a major emphasis on the gradual release of responsibility (GRR). As noted in the professional learning section, instructional technology can enhance great teaching practices. In this appendix we focus on instructional technology integration with GRR.

The GRR model of instruction calls for the responsibility of learning to be gradually released from what the teacher does to what students are able to know and do independently. The graphic below depicts the four components for GRR:



1. **Focus Lesson** – Teacher models, explains, demonstrates, and/or thinks aloud.
2. **Guided Instruction** – Teachers explicitly guide students. Teachers and students practice together.
3. **Collaborative Learning** – Students practice the strategy with peers, sometimes with facilitation from the teacher.
4. **Independent Tasks** – Students apply practice on their own and receive feedback.

The ultimate goal of GRR is for students to transfer learning to a new situation, allowing them to achieve independence in their learning.

Effectively using instructional technology tools will strengthen all components of GRR practices. For example, in a focus lesson, classroom resources like an overhead projector, screen and document camera make teacher modeling around reading, writing, problem-solving, and technology applications more efficient and effective. These devices also make it possible for students to project work from their own devices, which allows students to share their thinking during guided practice.

One-to-one student computers play a critical role in this process and open the door to creative and differentiated learning opportunities and products, some previously inconceivable. For example, in a "flipped classroom," teachers can prerecord focus lesson content on an online video that students can access anywhere and review at their own pace. Large-scale examples of this practice include the [Khan Academy](#) and [iTunes U](#). During guided practice, teachers can guide and monitor student learning instantaneously in complex tasks such as gathering and analyzing information, creating reports or videos, and interacting with people outside the classroom walls. In the



collaborative learning component of GRR, students can now collaborate with each other—not to mention other students or people beyond classroom or school walls—through real time video conferencing or through posting, analyzing, and providing feedback on student work that can be done anytime online (e.g., through a cloud storage space like Google Drive, collaborative sites, and blog posts).

Finally, students can engage in many independent tasks at their own pace and level that the other GRR components coupled with technology make possible. These include drafting, revising and publishing e-reports or stories that may include an audio file of them reading text; creating documentaries and videos and self-assessing themselves on rubrics; connecting to global information through the internet; becoming effective seekers and analyzers of information; engaging in reading and math learning apps that provide immediate feedback on proficiency and progress; participating in online classes; and exploring and developing electronic portfolios or Individualized Learning Plans for college, career, and community. Technology will help equalize educational opportunities, providing students with the necessary tools to become independent no matter their learning needs.

“When every student has a personal portable computing device connected to the Internet, the opportunity for students to work independently and at their own pace dramatically increases.”

-Project RED