

## CHAPTER 10 – TECHNOLOGY MANAGEMENT

### BACKGROUND

A school district's technology management affects the operational, instructional, and financial functions of the district. Technology management consists of planning and budgeting, technical infrastructures, application support, purchasing, and inventory control. To manage technology typically requires staff dedicated to administrative and instructional technology responsibilities.

Administrative technology includes systems that support a school district's operational, instructional, and financial functions. Administrative technology improves a school district's operational efficiency through faster processing, increased access to information, integrated systems, and communication networks. Instructional technology includes the use of technology as a part of the teaching and learning process. Instructional technology supports curriculum delivery, classroom instruction, and student learning.

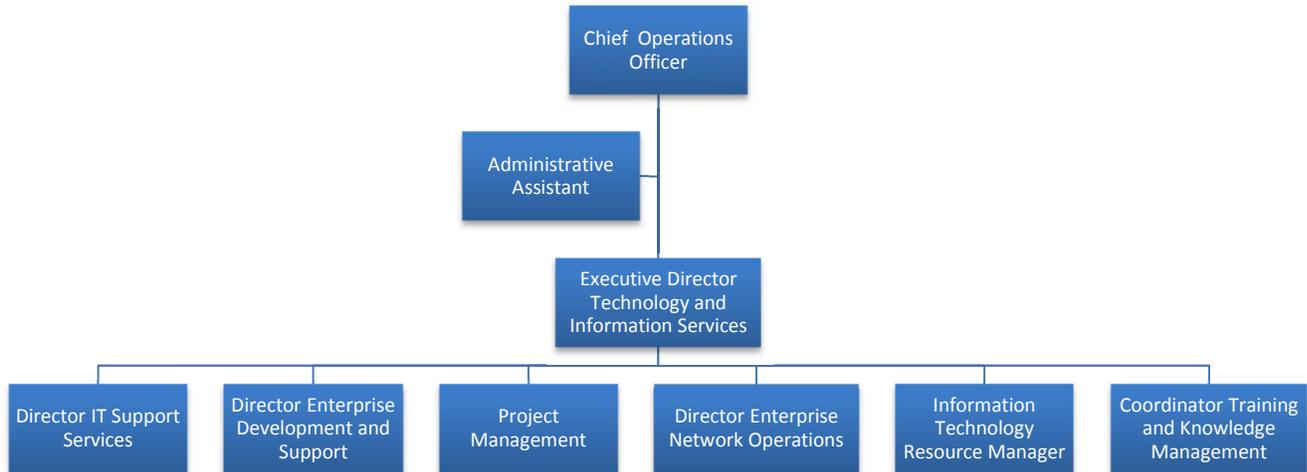
To facilitate technology management, a school district should have a technology plan that includes the integration of technology with administrative and instructional programs. A technology plan defines goals, objectives and actions for technology projects, assigns responsibility for implementation steps, and establishes deadlines.

In Metropolitan Nashville Public Schools (the School System), administrative technology is handled by the Technology and Information Services Department and instructional technology is handled by the Learning Technology and Library Services Department. **Exhibits 10-1** and **10-2** (both on the following page) show the organizational structure of the Technology and Information Services Department and Learning Technology and Library Services Department, respectively.

### CHAPTER HIGHLIGHTS

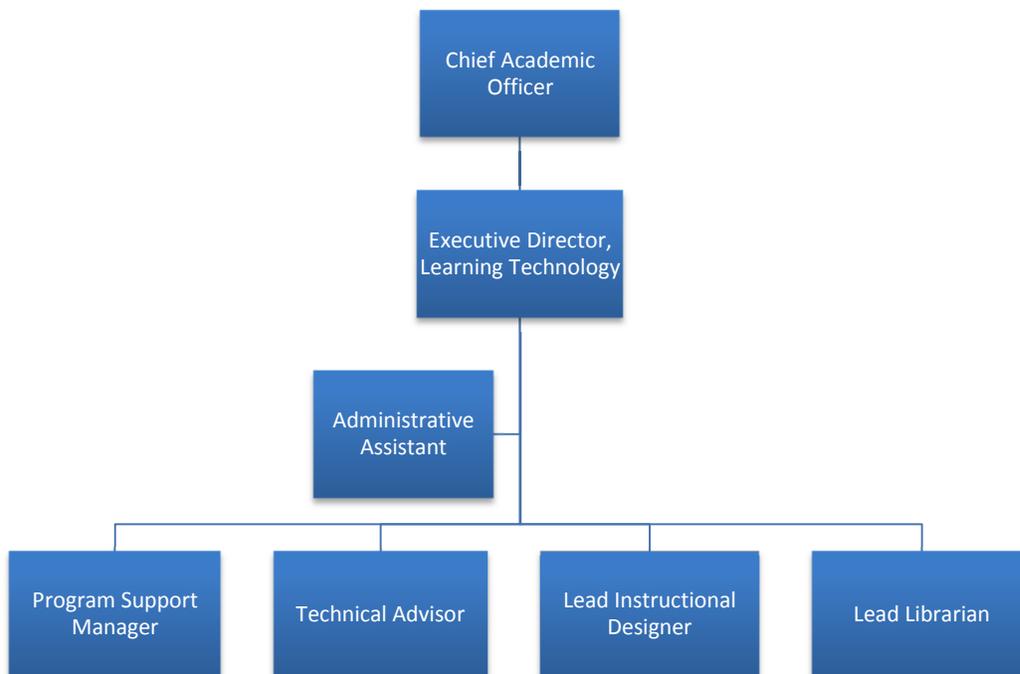
- The School System has a comprehensive data warehouse that provides pertinent student information that is consistent and accessible throughout the School System.
- The School System has a state-of-the-art professional development facility to provide a convenient and central location for instructional technology training.
- A methodology or formalized process would help determine the technical staff required to provide adequate and equitable support to the schools.
- A long-range technology plan that incorporates a hardware replacement strategy could more effectively drive district wide technology initiatives and technology infrastructure upgrades.
- Appointment of an information security officer would provide the expertise required to develop and manage technology security and risk strategies.
- A comprehensive disaster recovery/business continuity plan would ensure restoration and continuation of technology operations in the aftermath of a catastrophic event.
- A service-level agreement (SLA) would address the service provided issues between Metro Nashville Public Schools and the City of Nashville's Metro Information Technology Services Department.

**Exhibit 10-1**  
**Metropolitan Nashville Public Schools Technology and Information Services Department**  
**2013-2014**



Source: Metropolitan Nashville Public Schools Technology and Information Services Department, January 2014.

**Exhibit 10-2**  
**Metropolitan Nashville Public Schools Learning Technology and Library Services Department**  
**2013-2014**



Source: Metropolitan Nashville Public Schools Learning Technology and Library Services Department, January 2014.

The Technology and Information Services Department is led by the executive director of Technology and Information Services who reports to the chief operations officer. The executive director of Technology and Information Services is supported by the director Information Technology Support Services, director Enterprise Development and Support, Project Management, director of Enterprise Network Operations, Information Technology Resource Manager, coordinator Training and Knowledge Management, and an administrative assistant that is shared with the chief operations officer. The Learning Technology and Library Services Department is led by the executive director of Learning Technology who reports to the chief academic officer. The executive director of Learning Technology is supported by a program support manager, lead librarian, lead instructional designer, technical advisor, and administrative assistant. **Exhibits 10-3 and 10-4** show the departmental staffing chart by position for the Technology and Information Services Department and Learning Technology and Library Services Department, respectively.

**Exhibit 10-3**  
**Metropolitan Nashville Public Schools**  
**Technology and Information Services Department, Staffing Chart by Position**  
**2013-2014**

Position	Number of Staff
Executive Director Technology and Information Services	1
Administrative Assistant	.5
Information Technology Resource Manager	1
Director Enterprise Network Operations	1
Manager Systems Support	1
Database Administrator	2
System Administrator	3
Manager Network Operations	1
Infrastructure Support Specialist II	4
Network Operations Center Technician	1
Infrastructure Support Specialist III	2
Telephony Technician	1
Manager Special Projects Team	1
Desktop Support Specialist	2
Information Technology Resource Specialist	1
Telecommunications Specialist	1
Project Management	1
Associate Project Manager	1
Director Enterprise Development and Support	1
Manager Business Intelligence Solutions	1
Reporting Specialist (Contractor)	1
Manager Software Development Services	1
Software Developer II	5
Manager Apps Training and Support	1
Lead Applications Training Specialist	1
Applications Training Specialist	3
Student Management System Product Manager	1
Applications Integration Analyst	1
Applications Support Specialist	3

**Exhibit 10-3**  
**Metropolitan Nashville Public Schools**  
**Technology and Information Services Department, Staffing Chart by Position**  
**2013-2014 (Cont'd)**

Position	Number of Staff
Web Master	1
Coordinator Training and Knowledge Management	1
Director Information Technology Support Services	1
Senior Secretary	1
Manager Central Support Group	1
Repair Shop Specialist	2
Help Desk Supervisor	1
Help Desk Specialist	3
Cluster Technology Manager	6
Technical Support Specialist	48
<b>Total Staff</b>	<b>109.5</b>

Source: Technology and Information Services Department Organization Chart, February 2014.

**Exhibit 10-4**  
**Metropolitan Nashville Public Schools**  
**Learning Technology and Library Services Department, Staffing Chart by Position**  
**2013-2014**

Position	Number of Staff
Executive Director - Learning Technology	1
Administrative Assistant	1
Program Manager	1
Audio-Visual Receptionist	1
Facilities Technician	1
Technical Advisor	1
Multimedia Support Specialist	1
Learning Systems Support Specialist	1
Lead Instructional Designer	1
Instructional Designers	4
Lead Librarian	1
Training Development Specialist	1
Training Specialist	2
Media Specialist	1
<b>Total Staff</b>	<b>18</b>

Source: Learning Technology and Library Services Department Organization Chart, February 2014.

Shown in **Exhibit 10-5** is a comparison of the School System's Technology and Information Services Department staffing level with several peer school systems based on number of students and computers supported. The comparison shows that the School System's Technology and Information Services Department supports less students per staffer but support more computers per staffer.

**Exhibit 10-5**  
**Metropolitan Nashville Public Schools Peer School Systems Technology Staffing Level Comparison**  
**2013-2014**

School System	Number of Students	Number of Computers	Information Technology Staff	Students Supported Per Staffer	Computers Supported Per Staffer
Duval County Public Schools	124,918	61,568	127	984	485
Polk County Public Schools	95,445	49,296	113	845	436
Metropolitan Nashville Public Schools	82,842	62,273	109.5	757	569

*Source: McConnell Jones Lanier & Murphy LLP Review Team Research, February 2014.*

The mission of the Technology and Information Services Department is to enhance learning and improve productivity through the use of effective information and communications technologies. The Technology and Information Services Department is responsible for implementing and maintaining the technology infrastructure and telecommunications capabilities of the School System. For infrastructure, this responsibility includes deployment, maintenance, and support of the server environment (network, application, and database), computers (desktop, laptop, and tablet), and printers (local and networked). For telecommunications, this responsibility includes deployment, maintenance and support of the telephone circuits, telephones, telecommunications servers, communications switches and routers, Internet circuits, firewalls, and content filters. The enterprise software applications that are supported by the Technology and Information Services Department are shown in **Exhibit 10-6**.

**Exhibit 10-6  
Metropolitan Nashville Public Schools  
Technology and Information Services Department Supported Enterprise Software Applications  
2013-2014**

Application	Purpose
PowerSchool/SMS	Student Information Management System
Enterprise Business System (EBS)	Payroll/Human Capital/Benefits
The Library Corporation	Library Management System
PCG EasyIEP	Exceptional Pupil Management System
Edulog	Student Transportation Management
Follett Destiny	Textbook Inventory Management
Student School Assignment System	Independent Vendor
SchoolNet GradeSpeed	School System Gradebook Software (All Levels)
WinSnap/WebSmart	Food Services POS/BOH/FARL Management System
HealthOffice	Student Health Data Management
The School System's Asset Inventory Management System	School System Asset Inventory Management
Blackboard ConnectEd	Charter School Call Out System
Blackboard Learning Management System	Learning Technology Software
Parent Link	School System Call Out System
CPSI SIFVASEL	Student Email/Active Directory Account Management
XAP	State Student Transcript System
American Education Corporation	A+ Student Learning and Assessment Solution
Nashville Public Library	Limitless Library System
Active Networks	Content Management System
Procure-To-Pay	Purchasing/Travel

Source: Metropolitan Nashville Public School Technology and Information Services Department, February 2014.

The mission of the Learning Technology and Library Services Department is to support schools and departments in integrating mobile, interactive, and instructional technologies. The Learning Technology Department manages the deployment of digital media and learning management systems at all schools. To support the implementation of Common Core State Standards and the Partnership for the Assessment of Readiness for College and Careers, schools require technology training and the integration of technology in classrooms to ensure that students are familiar with a variety of devices and applications.

The School System has developed a Learning Technology Plan to drive the acquisition and integration of technology to engage students, transform teaching and learning, improve achievement growth, and equip students with skills necessary for college and career readiness. **Exhibit 10-7** depicts the goals and strategies in the plan. The Learning Technology Plan aligns with the School System’s Strategic Goal Two – “Graduate all students from high school with college and career readiness by ensuring academic success for every student”.

**Exhibit 10-7**  
**Metropolitan Nashville Public Schools Learning Technology Plan**  
**Goals and Strategies**

Goal	Strategy
Goal 1: Transforming Teaching and Learning	<ul style="list-style-type: none"> <li>A. Curriculum: Use of technology as a tool for learning will be integrated across a rigorous and relevant curriculum that prepares students to be college and career ready.</li> <li>B. Professional Learning: All teachers, principals, and administrators will have access to professional learning opportunities that model technology integration and prepare participants for leveraging technology as a tool for learning and engagement in the their classrooms, schools, and offices.</li> <li>C. Instruction: Instructional technology will be used as a tool for engagement and personalized learning.</li> <li>D. Human Capital: The School System will recruit and hire high quality teachers with basic technology competency and a willingness to use technology to engage students and personalize learning.</li> <li>E. Student Assessment Services: Assessment strategies will be incorporated to ensure that students are technology literate and college and career ready.</li> <li>F. The School System’s Ownership and Clear Understanding of Roles: For instructional technology implementation to be successful, all parties in the School System will need to have clear understanding of their roles and responsibilities, action steps, timelines, and outcomes.</li> </ul>

**Exhibit 10-7**  
**Metropolitan Nashville Public Schools Learning Technology Plan**  
**Goals and Strategies (Cont'd)**

Goal	Strategy
Goal 2: Redesigning School Learning Environments	<ul style="list-style-type: none"> <li>A. Technology and Infrastructure: Technology, infrastructure, and data training will be available and in place to support teacher and student access in these varied environments.</li> <li>B. School-Based Support Structures: Schools will be supported by school-based personnel trained in instructional technology and technical troubleshooting by the School System's experts.</li> <li>C. Facilities: Future construction and updating of learning environments will promote student collaboration; project based learning, and personalized learning via flexible, mobile furniture and fixtures.</li> </ul>
Goal 3: Building and Sustaining Community Leadership and Support	<ul style="list-style-type: none"> <li>A. Business and Community Organization Engagement &amp; Support: Collaborative oversight between the School System, business, and community leadership will hold the district accountable to this plan and provide assistance and support as needed for successful implementation.</li> <li>B. Marketing and Communication: Successful marketing and communication strategies will promote commitment to the successful integration of technology in K-12 classrooms from teachers, principals, administrators, parents, and students.</li> </ul>

Source: Metropolitan Nashville Public Schools Learning Technology Department, February 2014.

The School System's Board of Education has approved the Learning Technology Plan. To demonstrate commitment and monitor progress, the Learning Technology Plan is on every agenda of the School System's executive staff meeting. The executive director of Learning Technology and Library Services and the executive director of Technology and Information Services meet on a monthly basis to review and update the plan.

The School System's Technology and Information Services operational budget for school year 2013-2014 is \$12,074,200. The capital budget from which all technology equipment is purchased for school year 2013-2014 is \$10,000,000. Therefore, the total Technology and Information Services Department budget for school year 2013-2014 is \$22,074,200 or \$266 per student. In addition, the Technology and Information Services Department supports more than 12,000 administrative, education, and operations staffers. **Exhibit 10-8** shows a summary of Technology and Information Services operational and capital budgets.

**Exhibit 10-8**  
**Metropolitan Nashville Public Schools Technology and Information Services Department**  
**Operational and Capital Budget Summary**  
**2013-2014**

Budget Category	Amount
Salaries – Clerical and Support	\$6,702,200
Supplies and Materials	109,900
Other Expense	1,103,600
FICA, Medicare, Pension and Insurance	2,718,300
Travel / Mileage	61,600
Contracted Services	1,378,600
<b>Total Operational Budget</b>	<b>\$12,074,200</b>
Total Capital Budget	\$10,000,000
<b>Total Budget</b>	<b>\$22,074,200</b>
<b>Total Students</b>	<b>82,842</b>
<b>Average Per Student</b>	<b>\$266</b>

Source: Metropolitan Nashville Public Schools FY 2013-2014 Budget Report, February 2014.

The School System’s Learning Technology and Library Services Department operational budget for the school year 2013-2014 is \$1,391,400 or \$206 per teacher. **Exhibit 10-9** shows a summary of the Learning Technology and Library Services 2013-2014 operational budget.

**Exhibit 10-9**  
**Metropolitan Nashville Public Schools Learning Technology and Library Services**  
**Operational Budget Summary**  
**2013-2014**

Budget Category	Amount
Salaries – Clerical, Certificated, and Support	\$518,000
Supplies and Materials	65,000
Other Expense	8,000
FICA, Medicare, Pension and Insurance	185,400
Travel / Mileage	15,000
Contracted Services	600,000
<b>Total Budget</b>	<b>\$1,391,400</b>
<b>Total Teachers</b>	<b>6,757</b>
<b>Average Per Teacher</b>	<b>\$206</b>

Source: Metropolitan Nashville Public Schools FY 2013-2014 Budget Report, February 2014.

The School System has 62,273 student accessible computing devices for a student-to-computer ratio of 1.33:1. **Exhibit 10-10** provides a breakdown of student accessible computing devices.

**Exhibit 10-10**
**Metropolitan Nashville Public Schools Student Accessible Computing Devices Breakdown**

Computing Device	Number of Units
PC Desktop Computers	25,333
Apple Desktop Computers	1,342
PC Laptops	28,397
Apple Laptops	547
IPads	6,560
Miscellaneous Smart Devices	94
<b>Total Computing Devices</b>	<b>62,273</b>
<b>Total Students</b>	<b>82,842</b>
<b>Student-to-Computer Ratio</b>	<b>1.33:1</b>

Source: Metropolitan Nashville Public Schools Technology and Information Services Department, February 2014.

The School System's student-to-computer ratio is slightly better than the selected peer school districts and much better than the Council of the Great City Schools median. **Exhibit 10-11** below shows how the School System's student-to-computer ratio compares to the selected peer school systems and the Council of Great City Schools median.

**Exhibit 10-11**
**Metropolitan Nashville Public Schools  
Peer School Systems Student-to-Computer Ratio Comparison**

School System	Total Students	Total Computers	Student-to-Computer Ratio
Atlanta GA Public Schools	49,128	27,315	1.80:1
Duval County FL Public Schools	124,918	61,568	2.03:1
Polk County FL Public Schools	95,445	49,296	1.94:1
<b>Metro Nashville Public Schools</b>	<b>82,842</b>	<b>62,273</b>	<b>1.33:1</b>
<b>Council of the Great City Schools Median</b>			<b>2.13:1</b>

Source: McConnell Jones Lanier & Murphy Review Team Research, February 2014.

The School System is awaiting approval of a request for \$6,000,000 in capital funds to purchase and upgrade over 5,000 computers to ensure the district is prepared for the next generation of student instruction and testing.

## BEST PRACTICES

Best practices are methods, techniques, or tools that have consistently shown positive results, and can be replicated by other organizations as a standard way of executing work-related activities and processes to create and sustain high performing organizations. When comparing best practices, similarity of entities or organizations is not as critical as it is with benchmarking. In fact, many best practices transcend organizational characteristics.

McConnell Jones Lanier & Murphy LLP identified 10 best practices against which to evaluate the organization and management of the School System’s Technology Management function. **Exhibit 10-12** below provides a summary of these best practices. Best practices that the School System does not meet result in observations, which we discuss in the body of the chapter. However, all observations included in this chapter are not necessarily related to a specific best practice.

**Exhibit 10-12**  
**Summary of Best Practices - Technology Management**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
1.	Central repository for storage of pertinent student and district data that’s accessible for analytical and reporting purposes.	X		The School System has implemented a centralized data warehouse to store student data that can be accessed for analytical and reporting purposes.
2.	Three or Five-year long-range technology plan.		X	The School System does not have a technology plan. <b>See Observation 10-B.</b>
3.	Implement a robust network infrastructure to support the operational needs of the district and integration of technology in the classroom.	X		The School System has installed a wireless wide-area network to facilitate Internet/Intranet connectivity at all the schools.
4.	Develop a professional development program to train the instructional staff in the use and integration of technology concepts and tools in classroom.	X		The School System has developed the All-Star Training Program where select teachers are trained to be facilitators and instructors for technology integration at their school.
5.	Website design that uses space, color, content layout appropriately to be a good communications and marketing tool.		X	The School System’s websites need to be redesigned for better content layout and ease of maintenance. <b>See Observation 10-D.</b>
6.	Disaster Recovery Plan with key components.		X	The School System does not have a Disaster Recovery Plan. <b>See Observation 10-E.</b>

**Exhibit 10-12**  
**Summary of Best Practices - Technology Management (Cont'd)**

Best Practice Number	Description of Best Practice	Met	Not Met	Explanation
7.	Location of data center backup facility should be 10 to 50 miles from main data center.		X	The School System's planned data center back up facility location is only 2 miles from main data center. <b>See Observation 10-E.</b>
8.	Allocation of training budget for technology organizations is on a per-learner basis.		X	The Technology and Information Services Department does not have a training budget. <b>See Observation 10-F.</b>
9.	Service-level Agreements for internal and external service providers.		X	The School System does not have a service-level agreement with Metropolitan Information Technology Services for business application support. <b>See Observation 10-G.</b>
10.	Possess policies and procedures to govern technology functions and activities.		X	The School System has developed a standard operating procedures framework but has not developed any departmental policies and procedures. <b>See Observation 10-H.</b>

Source: McConnell Jones Lanier & Murphy LLP Review Team.

## ACCOMPLISHMENTS

### ACCOMPLISHMENT 10-A

**The School System has developed and implemented a comprehensive data warehouse to provide a central repository for student information that is consistent and accessible across the School System.**

At the urging of the state, the School System used Race-to-the-Top funds to develop and implement a centralized repository for pertinent student and other school system data that can be easily accessed and manipulated for analytical and reporting purposes. The data warehouse is a key initiative of the School System as it transitions to be data-driven. Demonstrating a commitment to data accuracy, the School System has put in place a data quality group with the responsibility to ensure that data going in and out of the data warehouse is current and accurate. Pertinent student data is extracted from the PowerSchool Student Management System and loaded into the data warehouse. The next evolution of the data warehouse is to make it a longitudinal data system. An education longitudinal data system is a data system with capabilities that include the following:

- collects and maintains detailed, high quality, student and staff-level data;
- links these data across entities and over time, providing a complete academic and performance history for each student; and
- makes data accessible through reporting and analysis tools.

An education longitudinal data system allows student and other district data to be linked and analyzed over periods of time versus the traditional data warehouse where the data is analyzed as a snapshot of a period in time.

### ACCOMPLISHMENT 10-B

**The School System has installed an Aruba based wireless wide-area network infrastructure at all schools to provide ready access to the Intranet/Internet and support the integration of technology throughout the School System.**

The infrastructure consists of category-6 commercial grade networks to provide 802.11n class wireless coverage into every classroom and common areas of schools. This wireless connectivity provides access to the Internet/Intranet sites and supports the “Bring your Own Device” initiative.

The wireless wide-area network is in the process of being upgraded to increase connection speed from 100MB to 1GB at all schools to provide the infrastructure to support the Partnership for the Assessment of Readiness for College and Careers implementation.

The wireless wide-area network is managed and monitored for service issues and standard bandwidth utilization. This allows for the planning of service increases based on trending utilization patterns.

**ACCOMPLISHMENT 10-C**

**The School System has constructed and equipped a state-of-the-art professional development facility at the Martin Professional Development Center Building to provide a convenient and central location for instructional technology training.**

The idea of the Martin Professional Development Center began in 2006 when the Nashville Public Education Foundation established a public/private partnership to improve the education experience of teachers. During the next two years, the foundation secured enough funds to turn the historic Eakin Elementary School into a new state-of-the-art professional development facility.

The Martin Professional Development Center is a high-tech facility designed to fulfill its mission of producing superbly trained educators. The center provides wireless Internet access to the 7,200-square foot Turner Hall that accommodates up to 500 guests (auditorium) or 350 guests (seated banquet-style). The center also provides ten training classrooms, ample meeting space, a technology wing with four training labs and 150-seat Teacher Resource Center.

The Martin Professional Development Center hosts the All-Star Training Program in which select teachers are trained in technology skills to be able to facilitate and train the teachers at their designated school to integrate technology in the classroom. This is a key initiative in the School System as it is the primary avenue for training the mass of teachers in technology skills and tools.

## DETAILED OBSERVATIONS

### STAFFING REQUIREMENTS

#### OBSERVATION 10-A

**The Technology and Information Services Department does not have a methodology or formalized process to assess and determine the technical support staff required to provide adequate and equitable support to the schools.**

Technical support is provided to the schools by Technical Support Specialists who are assigned to a specific cluster of schools. There are six clusters managed by cluster technology managers who are responsible for overseeing and prioritizing work tasks of their respective cluster. Staffing of the clusters is somewhat arbitrary based on the number of schools in the cluster and other subjective criteria. However, all schools are not the same size and do not have the same type and amount of equipment. This distinction leads to some clusters being understaffed and technical support tasks not being performed in a satisfactory or timely manner or not being completed at all.

In addition to handling routine technical problems, technical support specialists are requested to assist with new computing equipment imaging, testing, and rollout. Also, since the specialists are not authorized to keep spare part inventories, many times they must go to the central warehouse to pick up spare parts such as projector bulbs. This work is time consuming and diverts them from providing satisfactory routine support to users.

HelpSTAR is the web-based system used throughout the School System for submission and management of technology service requests. The system is used as a collaboration tool to prioritize and manage the technology support workload and communication of service request status to the requester. The system has dashboards, queries, and reports to provide real-time visibility into support performance.

Technical support at the schools becomes much more critical with the implementation of Common Core State Standards and the Partnership for the Assessment of Readiness for College and Careers which will rely heavily on computing equipment availability. The level of existing support raises concerns among the teaching staff as reflected in their survey comments shown below in **Exhibit 10-13**.

#### Exhibit 10-13

#### Metropolitan Nashville Public Schools Teacher Survey Technical Support Comments

Teacher Survey Technical Support Comments
"Help tickets get ignored for months"
"Tech support is frustrating. The tech people are usually pleasant to work with; however, waiting 3-5 months for a projector bulb eliminates the use of computer visuals and Elmos'. The Information Technology support people should have instant tickets available. When we stand in the same room and ask a question about something that is not working they may offer a suggestion but are clearly not able to do, what at home is a couple of clicks to fix a situation, but are not able to because they need a help ticket"
"Maintenance for non-emergency tickets is NOT replied to in a timely manner. Wi-Fi in the school has been updated but no one (teachers, students, or administrators) know how to link in to it. Therefore, students, and teachers are not able to work off of the Wi-Fi."
"Internet does not work about half the time. Computers are consistently not working. The School System is moving to computer-based testing next year, how will this work if the technology we have is not supported and maintained."

**Exhibit 10-13**

**Metropolitan Nashville Public Schools Teacher Survey Technical Support Comments (Cont'd)**

Teacher Survey Technical Support Comments
"Computer technology needs to be improved throughout the system. If we are going to be assessing students using computers, the students need to have routine access to the technology. More computers and greater bandwidth will be required for all schools."
"I have major concerns about PARCC testing occurring on ThinkPads. They are very difficult for students to use – super sensitive to kids' touch, opening multiple windows at one time, and small screen. It's bad enough to try to use them for research or learning, but the thought of high stakes testing on them, scary."
"To meet the needs of today's world, we need better training in teaching using computers. Then we need enough working computers available to teach our students. The current number of students-to-computers in my school is 8 to 1. I can't utilize a lot that is available to me and my students. More and better training and, foremost, enough computers to use them actively in the learning process are needed."
"The top two problems in my district are technology support and transportation issues."
"Schools should be assigned a technology specialist to help teachers really integrate technology."

Source: Metropolitan Nashville Public Schools Teachers Survey, April 2014.

A study by Massachusetts Institute of Technology in partnership with International Business Machines and Digital Equipment Corporation called "Project Athena" established some guidelines to help determine the staffing requirements to support a school district's technology environment. The resource variable and staffing ratio guidelines are shown in **Exhibit 10-14**. The approach taken by the study was to determine the human resource skills necessary to support the total environment, and then translate this into real numbers based on full-time employees.

**Exhibit 10-14**

**Massachusetts Institute of Technology "Project Athena" Study  
Resource Variable and Staffing Ratio Guidelines**

Resource Variable	Staffing Ratio
W = Number of workstations (Resources required to install, maintain, track and update)	W/500
U = Number of users (Account administration, user training, documentation, and configuration services)	U/1000
C = Number of clusters (physical co-located workgroups sharing servers, printers and other peripheral equipment)	C/15
A = Number of supported applications (Applications provided and supported centrally required to install, update, support, track and document software licenses)	A/50
V = Number of distinct vendor operating systems and platforms (Operating systems for different platforms that require frequent revisions and updates to and ensure interoperability with other systems and applications)	V/1
L = Number of licenses (Defined as the right to use the application software for multiple users on multiple platforms)	L/25

Source: Chaminade College Preparatory Information Systems (Arfman & Roden Report, 1992), September 2011.

The resource variable and staffing ratio guidelines can be used to determine the staffing level for an individual department or total staffing (TS) for an Information Technology organization ( $TS = W/500 + U/1000 + C/15 + A/50 + V + L/25$ ).

**RECOMMENDATION 10-A.1**

**Adopt a staffing methodology to assess and determine the appropriate staffing level for the technical support specialists required to provide adequate support to the schools.**

The department should use the appropriate resource variables and staffing ratios shown in **Exhibit 10-14** in developing the methodology. This methodology could also be used to equitably assign technical support specialists to the clusters.

For example, using the above guidelines for the number of devices supported, the current technical support specialists of 48 is understaffed ( $62,273 / 500 = 124.5$ ). Based on this calculation the current technical support specialist staff is less than half the number required to provide support to the schools. This validates what was conveyed in the technical support specialists focus group interview session that they are understaffed for the number of devices they have to support without including other technical tasks they are expected to perform.

The executive director of the Technology and Information Services Department should direct the Technology Department heads to use the adopted staffing methodology to assess and determine the appropriate staffing levels for their functional areas. The staffing methodology results can be used for staff level justification during the budgeting cycle.

**FISCAL IMPACT**

This recommendation can be implemented with existing resources.

**RECOMMENDATION 10-A.2**

**Develop a staffing plan to address any staffing shortfalls as a result of the assessments using the adopted staffing methodology.**

The executive director of the Technology and Information Services Department should collaborate with the Human Capital Department to develop the staffing plan. The plan should include position title, level and skills required, hiring timeline, and projected costs.

**FISCAL IMPACT**

The fiscal impact of this recommendation cannot be determined until the staffing assessment is completed and the staffing plan is developed.

**RECOMMENDATION 10-A.3**

**Develop key performance indicators with targets to measure the effectiveness of the technology support provided to the schools.**

A task force of representatives from the schools and the Technology and Information Services Department should collaborate to establish the key performance indicators and targets. Some samples of key performance indicators that should be considered include the following:

- service request acknowledgement time;
- service request resolution time;
- hardware request completion time;
- help desk first contact resolution;
- help desk abandonment rate; and
- help desk speed to answer.

The HelpSTAR system should be used to capture and track the performance data. The results for the performance indicators should be reported on monthly.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

## **PLANNING**

### **OBSERVATION 10-B**

**The School System does not have an adequate long-range technology plan that incorporates a hardware replacement strategy and links to the School System and campus improvement plans.**

Currently, the Technology and Information Services Department uses the Learning Technology Plan and the School System's Strategic Plan to drive its efforts. The major initiatives from these two plans include the following:

- provide a comprehensive and functional technology infrastructure;
- provide technology capabilities that are useful for staff members and students;
- use technology to support diverse learning techniques and styles;
- provide a means for interactive communication between the School System and parents, students, and community;
- provide information electronically about school and division programs and academic progress;
- provide systems to access relevant and current data by appropriate users; and
- provide systems, services and support to enable all students to have access to online instructional resources beyond school hours.

These initiatives are helpful, but do not provide a comprehensive roadmap for implementing technology initiatives and making technology investments. Without a well-planned comprehensive roadmap, technology projects are undertaken and investments are made in a haphazard manner.

A comprehensive long-range technology plan can effectively drive districtwide technology initiatives and required infrastructure upgrades to support the ever-changing technology landscape. Also, a long-range technology plan is required to solicit E-Rate and other federal/state grants to fund technology projects. The best practice for a school district's long-range technology plan timeframe is at least three-years to allow for planning, acquisition, implementation, and training on any new processes and equipment required to implement the plan. Some districts use a five-year plan if there is a hardware replacement strategy or lease program that requires the plan to extend beyond three-years.

A long-range technology plan typically includes goals, action plans, timelines, performance criteria and success measures, designated staff responsibility for goal accomplishment, and financial allocations. Well-developed, comprehensive long-range technology plans lay a foundation for effective planning and decision-making in helping a district achieve its stated goals. Also, comprehensive plans facilitate effective budget planning, resource allocations, and technology acquisitions. **Exhibit 10-15** shows a list of key components of a comprehensive long-range technology plan.

**Exhibit 10-15**  
**Comprehensive Long-Range Technology Plan Key Components**  
**May 2014**

<b>Long-Range Technology Plan Key Components</b>
District Profile – includes district statistics such as number campuses, students, technology budget, and the current technology infrastructure.
Executive Summary and Background Information – includes technology planning committee organization, vision and goal statements.
Needs Assessment – the assessment process and results of what is needed in the School System.
Technology Infrastructure Goals and Objectives – includes network standards.
Instructional Technology – include standards, acquisition process, and usage.
Technology Literacy – includes professional development requirements.
Administrative and Business Operations Technology – includes standards, acquisition process, and usage.
Technology Replacement Cycles
Hardware/Software – include standards and acquisition process.
Budget Projections and Funding Sources

*Source: McConnell Jones Lanier & Murphy LLP Review Team, Best Practices as Researched and Compiled, May 2014.*

**RECOMMENDATION 10-B.1**

**Research, assess, and develop a comprehensive five-year long-range technology plan.**

The Learning Technology Plan and the School System’s strategic plan should be used as a foundation for developing an upgraded comprehensive long-range technology plan. Also, the School System and campus Improvement Plans should be taken into consideration. The following steps should be taken for the development of the plan:

1. establish a Technology Committee to assist with the development of the long-range technology plan and provide guidance on other technology related matters. The Technology Committee should consist of representation from the following key stakeholder groups:
  - board;
  - administration/operations staff;
  - teachers/educational staff;
  - technology department;
  - students;
  - parents; and
  - community.
  
2. Re-evaluate and determine the technology department’s mission and vision. The mission and vision should be encompassed in two short statements that explain the overall purpose of the plan.

3. perform a formal needs assessment of administrative and operational hardware and software, including those used by Transportation and Food Service departments;
4. develop goals and objectives the plan should accomplish. The goals should be split into two categories: short-term and long-term;
5. develop a plan and timeline with who is responsible for each goal;
6. develop a budget for the accomplishment of each of the goals. This should include funding sources and what happens if funding is no longer available;
7. develop a process to evaluate the plan on a regular basis and to be updated as needed; and
8. submit the plan for approval through the appropriate channels.

During the development of the plan the Technology Committee should meet on a regular basis to provide input and review progress. Upon completion and approval of the plan, the committee should meet at a minimum twice annually to review progress in accomplishing the plan goals and to update the plan as needed.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

#### **RECOMMENDATION 10-B.2**

**Develop a detailed hardware migration and replacement strategy that would integrate with the five-year long-range technology plan.**

Steps that can be taken in establishing the strategy are:

- establishing the criteria to be used in determining the hardware to be migrated or replaced;
- locating and tagging the hardware earmarked for replacement;
- developing schedule and timeline for the hardware replacement; and
- establishing a budget and funding source to replace the hardware.

This recommendation is vitally important as the School System becomes more data driven and the increasing need to provide reliable hardware to support computer-based testing.

Many school districts are using leasing as a viable option to fund their hardware replacement strategy. Due to capital funding constraints, this is an option the School System schools should consider. The leasing programs at some districts have resulted in a lower total cost of ownership (TCO) because of ensured standardization and lower maintenance costs. It also assures a consistent refresh process and cycle with the most up-to-date hardware at the time.

#### **FISCAL IMPACT**

The fiscal impact of this recommendation cannot be determined until the hardware replacement strategy is established and the method of funding is determined.

**OBSERVATION 10-C**

**The School System does not have an information security officer to provide leadership and expertise to develop and manage technology security and risk strategies.**

School districts, regardless of their size, face Information Technology security risks. Threats such as worms and viruses, cyber-attacks, the loss of sensitive information and identity theft are ever-evolving. School district officials must be diligent about understanding the risks and taking appropriate steps to mitigate them. The following are some steps that school districts can take include the following:

- designate a primary individual responsible for technology security;
- know how to recognize that there might be a security problem;
- understand how to deal with security problems;
- physically protect equipment;
- protect essential hardware/software;
- control access;
- protect information;
- implement training and awareness programs;
- develop Internet and acceptable use policies; and
- take steps to securely dispose of storage media and equipment.

Taking many of these steps is vitally important to the School System as it pursues a vision of becoming data-driven and with the implementation of a comprehensive data warehouse. Both of these initiatives consist of the collection and storage of sensitive student, instructional, and operational data. As custodian of this data, the School System must insure that proper storage, access, and use of the data are maintained. This goal requires dedicated leadership and expertise to coordinate and manage the development, implementation, and administration of a range of technology security processes, policies, and procedures based on industry guidelines. As a start, the School System has developed and published on its website the following security related policies that include the following:

- technology acceptable use policy;
- student use of personal technology;
- data warehouse security;
- employee social media policy; and
- use of media and computer software in schools.

**RECOMMENDATION 10-C.1**

**Appoint a dedicated technology security officer to ensure that its information security needs are met.**

The individual should be qualified either as a Certified Information Systems Security Professional (CISSP), Certified Information Security Manager (CISM), or possess an equivalent industry certification. The

individual should also have knowledge of the Privacy Act, Children’s Internet Protection Act (CIPA), Children’s Online Privacy Protection Act (COPPA), and Family Educational Rights & Privacy Act (FERPA). The technology security officer’s responsibilities should be but not limited to the following:

- provide leadership and expertise working with the School System’s leadership to develop and manage technology security and risk strategies;
- provide strategic direction for the management of security risks;
- maintain current knowledge of rules, regulations, legislation, technology, and procedures governing Information Technology;
- keep current on emerging internet threats and coordinates proactive internal responses;
- develop and maintain information security policies and procedures that ensure appropriate technical and administrative controls exist across all Information Technology resources and data;
- direct security/risk assessment efforts;
- manage security audits, controls and assurance activities;
- manage an information security incident management program to ensure effective forensic analysis, interviewing, incident documentation, escalation and communication processes with established lines of authority and external organizations (law enforcement, media, community, and parents), timely containment and correction of security breaches, and subsequent prevention and detection measures;
- define security aspects of systems architectures, determine testing requirements and methodologies, and conduct analytical risk management activities related to the development of information systems; and
- manage the development, implementation, and maintenance of the School System’s disaster recovery plan.

The technology security officer should collaborate with the Metropolitan Information Technology security officer to ensure consistency in policies and that the School Systems’ security concerns are addressed for systems hosted and supported by Metropolitan Information Technology Services.

The executive director of Technology and Information Services should define the criteria and skill requirements for the information security officer position and collaborate with Human Capital to determine how it should be filled.

## **FISCAL IMPACT**

If the appointment of the technology security officer is made with an outside hire, based on the salary research for the Nashville area, the fiscal impact would be \$70,000 per year. The five year impact would be \$350,000 ( $\$70,000 \times 5 = \$350,000$ ).

## **SCHOOL SYSTEM WEBSITE**

### **OBSERVATION 10-D**

**The School System's and individual campus websites are not well designed, or used as effective communication and marketing tools.**

The School System's website layout has a substantial amount of verbiage on the main webpage making it appear cluttered and uninviting. The menu tabs are well-defined and displayed at the top of the webpage making navigation within the site very easy. For the most part, the campus' websites have the same main tab layout as the School System's website and all have the School System's information window area at the top that is used to display districtwide information. But the campus' website content layouts are inconsistent.

The School System's website content is managed and updated by the Communications Department. Each school has a designated content manager who is responsible for managing the website and updating the content. The School System's webmaster is responsible for designing and updating the School System's and all schools' website layout templates. Request for website access, content or template changes are received through the HelpSTAR system. These requests are reviewed regularly and handled by the Communications Department and Webmaster accordingly.

Since there is no backup for the webmaster, some template or content changes may take longer than expected due to workload constraints. It was conveyed during the review team interview sessions that the website is hard to update due to the Action Point platform it is based on. The School System has recognized this as a problem area and has begun to put plans in motion to move to a different platform such as SharePoint.

For a license fee, the School System uses the Active Network Content Management System for managing the content displayed on the School System and schools websites. A content management system provides the capability to manage the content of a website without technical skills. An application like SharePoint can provide this same capability resulting in a potential cost savings.

While the School System and schools have websites they are not being used as effective communication and marketing tools. For example, the School System website has basic information about board members and district staff, but it is not as comprehensive as found on other large school districts' websites. Each individual school's website differs greatly in content layout and quality. Although many schools serve students with significant bilingual populations, at the time of the review team visit, there was no website translator installed for the School System or school websites. This is critical if the desire is to use the websites as effective communication tools.

**RECOMMENDATION 10-D.1**

**Develop plans to redesign and implement new websites for the School System and schools.**

In developing the plans and redesign criteria, key stakeholders from the following functions should be actively involved:

- district administration;
- principals;
- teachers;
- students;
- parents; and
- community.

Regular design and implementation meetings should be held to ensure that all stakeholders’ needs are being addressed as the project proceeds.

District and school websites should be effective communication and marketing tools. A visitor gains a first impression about the school district when they initially view and read their website. The site should be up-to-date with quality, error-free content that’s interesting to read and easy to find. **Exhibit 10-16** provides some best practice tips to be followed in redesigning and updating the content of the School Systems’ websites.

**Exhibit 10-16**  
**Best Practice Tips for Redesigning Metropolitan Nashville Public Schools Websites**

Tip	Rationale
Make/Keep it Up-to-Date	<ul style="list-style-type: none"> <li>• A quality website offers current, timely information about the organization. Visits are made to the website for a reason—to find out something about the School System or school. Some may simply want the school’s phone number or address, while others need more information about the upcoming events. If the site is filled with outdated information, visitors wonder when it was last updated.</li> <li>• Be sure that the website includes only current information. If possible, set time-sensitive posts to expire off the site automatically. Place the School System or school’s phone number, address, and staff email addresses in a prominent location so the school community can find what they need quickly.</li> </ul>

**Exhibit 10-16**

**Best Practice Tips for Redesigning Metropolitan Nashville Public Schools Websites (Cont'd)**

Tip	Rationale
Brag on the School System or School	<ul style="list-style-type: none"> <li>If the School System or school is like most others, the students and teachers are actively involved in creative, diverse activities that build a successful learning community, about which you love to brag. Word of mouth only gets so far, so brag online too! School choice makes competition within a town—and even district—fierce. So devote a Web page to featuring school successes and to bragging on the students and staff. When prospective families see what great, devoted teachers are in the school, it just might outshine the school down the street.</li> </ul>
Look for Errors	<ul style="list-style-type: none"> <li>The School System and schools are in the business of educating the future leaders of the country and there's nothing worse than typos on a district or school website. Take the time to proofread something that's going worldwide on the Web, it begs the question, "Is that how much you care about my child?" Have another set of eyes look at the website before it goes live, making sure the website is professional and error-free.</li> </ul>

Source: School Webmasters Blog "Don't Just Have a Website", November 2013.

The main objective in redesigning the School System's and schools' websites should be to make them effective communication and marketing tools that are easy to manage and maintain. **Exhibit 10-17** shows ten things that must be avoided to ensure that quality websites are redesigned to meet that objective.

**Exhibit 10-17**

**Ten Things to Avoid in Redesigning Metropolitan Nashville Public School's Websites**

Avoid	Reason
1. Counters	<ul style="list-style-type: none"> <li>They do not add credibility to the School System, school or website and look amateurish. For analytical purposes, view site statistics through the server logs (or any statistics analysis not publically displayed). The site visitors don't really care how many "hits" your site gets.</li> </ul>
2. Excessive Animation or Flashing Text	<ul style="list-style-type: none"> <li>If the animation does not serve a purpose and add to the message, lose it. In the 90's they were fun, but have now become annoying and detract from the professionalism of the site and the message in the content. The site is there to provide useful and current information.</li> </ul>

**Exhibit 10-17**

**Ten Things to Avoid in Redesigning Metropolitan Nashville Public School's Websites (Cont'd)**

Avoid	Reason
3. Broken Links	<ul style="list-style-type: none"> <li>There are tools that can be used to check the entire site for any broken links. Get in the habit of running those frequently to keep the links useful. Broken links make site visitors feel that the site is stale and the School System or school don't care enough to keep it fresh. Parents also get upset when the form or page they are looking for is no longer there. Off-site links are not under your control, but when they become broken, fix or delete them.</li> </ul>
4. Under Construction	<ul style="list-style-type: none"> <li>All sites should be constantly under construction if they are to stay current and useful. However, don't place any "Under Construction" signs on the site. If it is not ready to display, don't make the page live until it is.</li> </ul>
5. Slow Page Load Speeds	<ul style="list-style-type: none"> <li>Fast wins! The established standard is text that is visible in five seconds or less. It is acceptable for graphics to take a few seconds longer if they are worth waiting for, but always optimize them for the Web. However, while speed is important, don't completely sacrifice quality for two seconds of load time. Pixilated photos detract from visual appeal and professionalism. A site exists to provide information to the customers—parents, students, staff, potential new hires, and the community—so always keep their needs at the forefront of all design decisions. They went to the site to save time, don't test their patience or they will leave.</li> </ul>
6. Splash Screens or Doorway Pages	<ul style="list-style-type: none"> <li>Site visitors want to get to the information they are looking for and not to see the mascot growl or roar or the logo morph into something clever. It's fun for the designer, but a waste of time for your target audience.</li> </ul>
7. Inconsistent Navigation	<ul style="list-style-type: none"> <li>The site visitors should feel confident that while transitioning from page-to-page the navigation structure will remain consistent. The navigation should be kept straight-forward and simple. Do not confuse the visitor with redundant navigation scattered around the page, with different buttons or links pointing to the same page.</li> </ul>

**Exhibit 10-17**

**Ten Things to Avoid in Redesigning Metropolitan Nashville Public School’s Websites (Cont’d)**

Avoid	Reason
8. Inconsistent Theme and Style	<ul style="list-style-type: none"> <li>A professional site design will maintain a theme throughout. This tells visitors that there is care enough to build a cohesive, well thought out website. It also assures visitors that they haven’t wandered off the site. Don’t change styles from one department to the next just because they want to do their own thing. The site needs to display an organized front, not a fragmented, departmentalized image. A district or school site shouldn’t be a reflection of individual personality, but a team of professionals dedicated to a united cause.</li> </ul>
9. Stingy White Space	<ul style="list-style-type: none"> <li>Readability requires the good use of white space. Use adequate margins and line-height and avoid wide blocks of text that are difficult to read. On a monitor, it is too difficult and they simply won’t do it if the text runs from one side of their screen to the other.</li> </ul>
10. Obnoxious Background Colors	<ul style="list-style-type: none"> <li>The School System and school colors may be neon orange and teal, but don’t use them for background colors on the website or as a text color. While there may be an attempt to “brand” the website with the School System or school colors, obnoxious colors make it difficult to read content and distracts the user. Save those colors for graphic images, the school mascot, or maybe a heading or two. Don’t overdo it.</li> </ul>

Source: School Webmasters Blog “10 Things to Avoid on Your School Website”, February 2013.

Adhering to the above “tips” and “things to avoid” will ensure that the redesigned district and schools websites will be effective communication and marketing tools for years to come.

The Clarksville-Montgomery County School System’s website, [www.cmcss.net](http://www.cmcss.net), is an excellent example of a district’s website that is well-designed and has spacious content layout. This school system’s school websites have a consistent design and content layout.

**FISCAL IMPACT**

This recommendation can be implemented with existing resources.

**RECOMMENDATION 10-D.2**

**Redesign and implement new websites using SharePoint as the platform.**

SharePoint is already implemented in the School System and can provide the functionality required for high-quality websites. Since SharePoint is already installed in the School System, there will be no added cost to use it. SharePoint’s functionality includes content management, which eliminates the need for the Active Network Content Management System resulting in a potential cost savings to the School System. Also,

SharePoint provides for better collaboration and personalized content views. This feature is important in maintaining website consistency across the School System.

The executive director of Technology and Information Services should direct the webmaster to design and implement new school system and campus websites using SharePoint in accordance with the redesign and implementation plan developed by the key stakeholders.

#### **FISCAL IMPACT**

Using SharePoint as the new website platform would eliminate the need for the Active Network Content Management System. This change would result in an annual license fee savings of \$18,000. The five-year cost savings would be \$90,000 ( $\$18,000 \times 5 = \$90,000$ ).

### **DISASTER RECOVERY PLAN**

#### **OBSERVATION 10-E**

**The School System does not have a comprehensive disaster recovery/business continuity plan to ensure continuity of operations in the aftermath of a catastrophic event.**

Disaster recovery and business continuity planning are related interconnected concepts dealing with different aspects as defined below:

- disaster recovery addresses what processes and solutions are in place to resume operations; and
- business continuity asks are redundant systems, processes, and services available to continue operations while recovery takes place.

Successful disaster recovery begins and ends with advance planning. Although the School System has begun putting an infrastructure in place to provide a redundant backup facility, there is no comprehensive plan to direct and manage those efforts, which are being performed piecemeal with no realistic timeline for completion.

The primary objective of a disaster recovery/business continuity plan is to provide a set of actions to be taken to minimize chaos and ensure organizational stability and orderly recovery after a disaster. **Exhibit 10-18** shows the components of a comprehensive best practices disaster recovery plan.

**Exhibit 10-18**  
**Components of a Best Practices Disaster Recovery Plan**

<b>Components</b>	
1.	Executive Summary
2.	Disaster Recovery Planning
2.1	Identification and Analysis of Disaster Risks/Threats
2.2	Classification of Risks Based on Relative Weight
2.2.1	External Risks
2.2.2	Facility Risks
2.2.3	Data Systems Risks
2.2.4	Departmental Risks
2.2.5	Desk-Level Risks
2.3	Building the Risk Assessment
2.4	Determining the Effects of Disaster
2.4.1	List of Disaster Affected Entities
2.4.2	Downtime Tolerance Limits
2.4.3	Cost of Downtime
2.4.4	Interdependencies
2.5	Evaluation of Disaster Recovery Mechanisms
2.6	Disaster Recovery Committee
3.	Disaster Recovery Phases
3.1	Activation Phase
3.1.1	Notification Procedures
3.1.2	Damage Assessment
3.1.3	Activation Planning
3.2	Execution Phase
3.2.1	Sequence of Recovery Activities
3.2.2	Recovery Procedures
3.3	Reconstitution Phase
4.	The Disaster Recovery Plan Document
4.1	Document Contents
4.2	Document Information
	– Purpose
	– Scope
	– Assumptions
	– Exclusions
	– System Description
	– Roles and Responsibilities
	– Contact Details
	– Activation Procedures
	– Execution Procedures
	– Reconstitution Procedure
4.3	Document Maintenance
	– Periodic Mock Drills
	– Experience Capture
	– Periodic Update

Source: Cisco Systems, *Disaster Recovery Best Practices*, 2008

A comprehensive disaster recovery/business continuity plan takes into consideration all aspects of the technology environment such as the following:

- computer room operation/equipment;
- servers;
- network infrastructure/equipment;
- software applications;
- database content; and
- telephony operation/equipment.

A key component of the disaster recovery process is having a backup facility with the capacity to host the necessary technology infrastructure to maintain operations during and after a disaster. A popular strategy is to have an external site that can support business systems, applications, and customer data until the primary data center can return to normal operations.

**RECOMMENDATION 10-E.1**

**Establish a disaster recovery team.**

The team should be comprised of representatives from the director’s office, principals, teachers, administrative staff, technical staff, maintenance, security, and external vendors with the mission of developing a comprehensive disaster recovery/business continuity plan. **Exhibit 10-19** shows actions to be taken in developing the plan.

**Exhibit 10-19**  
**Actions to Develop a Comprehensive Disaster Recovery/Business Continuity Plan**

Action to be Taken	Rationale
Work as a team	<ul style="list-style-type: none"> <li>• It is vital to take a big picture view of the School System in developing the plan. If only one individual or group creates the plan, something could easily be overlooked.</li> </ul>
Define the scope and mission	<ul style="list-style-type: none"> <li>• The scope statement should explain why and how the disaster recovery team is going to develop the plan.</li> <li>• The mission statement should clearly define the document’s main purpose.</li> </ul>
Assess the risks	<ul style="list-style-type: none"> <li>• The risk assessment should review all of the risks the School System may face – even those that seem wildly outlandish. Use the team’s best judgment to single out the most credible threats to the School System’s security; these are the crises the plan should ultimately address.</li> </ul>
Define priorities and perform a business impact analysis	<ul style="list-style-type: none"> <li>• Deciding what’s most important to the School System’s day-to-day operations will help the team determine how to best leverage financial and staff resources to protect those interests.</li> </ul>

**Exhibit 10-19**

**Actions to Develop a Comprehensive Disaster Recovery/Business Continuity Plan (Cont'd)**

Action to be Taken	Rationale
Define recovery strategies and procedures	<ul style="list-style-type: none"> <li>• This section of the plan should describe each disaster and recommend actions to take if it occurs.</li> <li>• The plan should outline the costs associated with recovery efforts and the procedures to follow if the plan must be executed.</li> </ul>
Develop a communication plan	<ul style="list-style-type: none"> <li>• This section of the plan should define each disaster's actual or potential threat to human safety or to property; the need to relocate operations; and acceptable time periods for response and recovery.</li> <li>• Define recovery teams, recovery infrastructure, and alternate sites.</li> <li>• Collect and have available in one place the phone numbers and other personal contact information of internal and external personnel who should be contacted if an emergency occurs.</li> </ul>
Create an appendix	<ul style="list-style-type: none"> <li>• A disaster recovery plan should be mostly nontechnical. There will be a need for solid technical documentation to recover the systems once the immediate trauma of a crisis has passed.</li> <li>• Include in the plan's appendix a comprehensive inventory of all Information Technology resources, data backup policies, vendor lists, service contract lists, diagrams and other technical specifications.</li> </ul>
Consider the disaster recovery plan a living document	<ul style="list-style-type: none"> <li>• Failing to keep the plan up-to-date defeats the purpose of having one.</li> <li>• Store a physical copy of the document in a three-ring binder that's kept in the data center (or another secure location) so it's easy to access if the systems go down.</li> <li>• Keep a record of all changes, and be sure to date and sign off on each modification.</li> </ul>
Test often	<ul style="list-style-type: none"> <li>• There's no point in having a well-thought out plan if it can't be executed. Testing the plan regularly will ensure that problems are addressed before an actual disaster occurs.</li> </ul>

Source: EdTech Magazine "How to Write an Effective Disaster Recovery Plan", August 2011.

Several key essential elements the disaster recovery/business continuity plan should include are:

- complete list of critical activities performed within the School System;
- identity of which systems and staff are necessary to perform functions;
- list of key staff for each function and their responsibilities;
- inventory of all technology assets including hardware, software systems and data, documentation, and supplies that correctly identify the location with sufficient information to document loss for insurance recovery;
- defined actions to be taken when a pending disaster is projected; and

- actions to be taken to restore critical functions.

### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

### **RECOMMENDATION 10-E.2**

#### **Revisit the selection of the planned location to house the backup computing facility.**

Based on the best practice of having a backup facility 10 to 50 miles from the primary data center puts the planned location too close to the main data center to be a viable option since it is only approximately two and a half miles away.

In selecting a new backup facility the School System should consider two approaches, which are to build its own backup data center or contract out for these services with suitably qualified third-party organizations. The following are key points in favor of building a backup facility:

- management control of these specialized resources;
- utilization of them as alternate processing centers to handle heavy usage periods;
- security controls managed by the School System; and
- reduced likelihood of school data being intermingled with other organizations' data.

Some negative factors include:

- start-up costs associated with building the facility;
- increased real estate costs and general overhead for the backup space; and
- costs for staffing the backup site.

Points in favor of outsourcing disaster recovery to a third-party include:

- minimal or no start-up costs;
- shared costs of staffing and technology resources;
- managed security at the site; and
- on-site expertise available 24-7.

Downsides of a third-party solution include:

- potential hidden costs or fees associated with declaring a disaster; and
- potential unavailability of facilities if too many subscribers are already using the backup center.

Among the key issues to be addressed are costs (upfront and ongoing), availability of resources (human and technology) when needed, additional unplanned costs following a disaster, and contractual issues. Also, in

evaluating backup facility selection options Metropolitan Information Technology Services' approach and backup facility should be considered.

The executive director of Technology and Information Services should direct the director of Enterprise Network Operations to assess and select a backup facility location that best meets the needs of the School System in accordance with best practices.

#### **FISCAL IMPACT**

The cost to implement this recommendation cannot be determined until a decision is made on the back up facility approach and location.

### **PROFESSIONAL DEVELOPMENT AND TRAINING**

#### **OBSERVATION 10-F**

**The School System lacks a professional development and training program that ensures the technical staff possesses the knowledge and skills to effectively perform their job responsibilities.**

A consistent and common theme expressed during interviews with the technical staff was the lack of and need for training. Due to the absence of formal training, the technical staff feels that they are thrown into jobs that they are not prepared adequately to perform. This situation leads to a perceived sink or swim work environment. Training that they receive is either free vendor offered, free webinars, or obtained on their own. The executive director of the Technology and Information Services Department confirmed that there is no money budgeted for training. The few outside training courses and seminars that members of the department attend are paid for out of the travel budget.

Professional development is the continuous process of acquiring knowledge and skills that relate to one's job responsibilities or work environment. It plays a key role in maintaining trained, informed, motivated staff. There are a variety of approaches to professional development, including consultation, coaching, training, mentoring, and technical assistance. Training encompasses all types of facilitated learning opportunities, ranging from formal coursework, conferences and seminars, and on-the-job training (OJT).

A professional development plan consists of clear guidelines for knowledge and skills improvement to include goals, rationale, activities, milestones, and resources. The following are benefits of an effective professional development and training program:

- provides a clear statement to the staff that there is interest and commitment to their professional growth;
- focuses on the mutual commitment (employee and employer) necessary to make career development a reality;
- enables predictable budgeting of training costs; and
- provides for feedback on the efficacy of training.

**RECOMMENDATION 10-F.1**

**Develop a professional development and training program for the technical staff that would be incorporated into the performance evaluation process.**

The Technology and Information Services management team in collaboration with Human Capital should clearly define development/training objectives and a development/training plan with activities, sources/timing, and expected completion date for each technical staff member. Participating in the professional development process should produce a formal, written document that is agreed upon by the manager and employee. A copy of the plan should be stored in the employee's personnel file and reviewed with the manager on a routine basis.

**FISCAL IMPACT**

This recommendation can be implemented with existing resources.

**RECOMMENDATION 10-F.2**

**Establish a training budget to ensure the technical staff has the appropriate knowledge and skills to perform their job responsibilities.**

Training is highly important to keep the technical staff abreast of the ever-changing nature of technology equipment and applications. This is apparent in the School System as the move is made to become a data and technology-driven district. The training budget allocation should be adequate enough to accommodate the professional development/training plans and the knowledge required to support the technology infrastructure and applications. The best practice for Information Technology organizations to allocate a budget for training is on a per-employee basis.

**FISCAL IMPACT**

Based on the 2013 Training Industry Report, on average, across all industries including education, organizations spent \$881 per-employee for training. Using that figure as the base with the total technical staff count of 108, the annual training cost for the Technology and Information Services Department would be \$95,148 ( $\$881 \times 108 = \$95,148$ ). The five-year cost would be \$475,740 ( $\$95,148 \times 5 = \$475,740$ ).

**CROSS AGENCY WORKING RELATIONSHIPS****OBSERVATION 10-G**

**Metropolitan Nashville Public Schools Technology and Information Services Department and the City of Nashville's Metropolitan Information Technology Services Department do not have a positive working relationship.**

The mission of Metropolitan Information Technology Services Department is to provide information, communication and business solutions to the departments and agencies of the Metropolitan Government so that they can achieve their business objectives. The Department supports more than 50 departments and agencies that include police, judicial, sheriff, fire, airport, and the hospital system.

Also, Metropolitan Information Technology Services hosts and supports the Oracle Enterprise Business Solution (EBS) used by the School System. However, this support is viewed as inadequate and unresponsive due to the unique and time-sensitive requirements of the School System. Therefore, it is the perception within the School System that Metropolitan Information Technology Services is insensitive and unwilling to make changes to the Oracle system to accommodate their unique requirements. Although Metropolitan Technology and Information Services Department has a person assigned to help support the Oracle system, it is difficult to make required changes due to access restrictions. This has led to a lack of trust and frustration between the two organizations.

A service-level agreement (SLA) between the School System and Metropolitan Information Technology Services would address this issue, but one has not been executed. A service-level agreement is a written document describing the expected level of service, the metrics by which the service is measured, and the remedies if the agreed-upon service level is not achieved.

The School System and Metropolitan Information Technology Services do not have a good line of communication. This situation results in School System personnel concluding that they are denied input on major decisions that could affect the School System. A recent example is the Kickoff of the Open Data Initiative where no one in the School System was aware or involved until the chief financial officer received an e-mail and followed up to inquire about the situation. However, Metropolitan Information Technology Services believes there are forums available to school personnel to provide their input and express their concerns but they choose not to participate. Metropolitan Information Technology Services holds regularly scheduled governance meetings to discuss all aspects of events within the department but, according to Metropolitan Information Technology Services, there is seldom representation from the School System.

However, the Kronos (Automated Time and Attendance System) Project is a joint initiative that is progressing with good results. The project team is comprised of representatives from the School System and Metropolitan Nashville Government that have participated in all phases of the project from planning through implementation. Thus far, the project is progressing on schedule with the required participation from both parties.

#### **RECOMMENDATION 10-G.1**

**Form a task force of key stakeholders from the School System and Metropolitan Government to address and resolve issues with the Oracle Enterprise Business Solutions (EBS) that impacts the school district's requirements.**

The areas that should have representation, but are not limited to include the following:

- Metropolitan Nashville Public Schools
  - Finance;
  - Purchasing;
  - Warehousing;
  - Human Capital; and
  - Technology and Information Services.

- Metropolitan Nashville Government
  - Finance; and
  - Information Technology Services.

The task force will be responsible for addressing and resolving all issues with the Oracle Business Solutions (EBS) that impact the School System and prioritize and monitor any application/system changes that may be required. The Task Force should meet at least quarterly or more often if needed.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

#### **RECOMMENDATION 10-G.2**

**Develop a service-level agreement (SLA) between the School System’s Technology and Information Services Department and Metropolitan Nashville Government’s Information Technology Department based on input from the task force to ensure that support and services provided meet expectations.**

Based on best practices, a service-level agreement should consist of the following (which may not all apply):

- definition of services;
- performance measurements;
- problem management;
- customer duties;
- warranties;
- disaster recovery; and
- termination of agreement.

Performance measured against the service-level agreement (SLA) should be monitored and reviewed on a regular basis.

The executive director of Technology and Information Services should collaborate with the director of Metropolitan Information Technology Services to develop a service-level agreement (SLA) that addresses the performance and support requirements of the School System.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

#### **RECOMMENDATION 10-G.3**

**Represent the School System’s Technology and Information Services Department at all governance meetings held by Metropolitan Information Services Department.**

The executive director of Technology and Information Services Department or his designee should attend all pertinent meetings held by the Metropolitan Information Services Department. The representative must be authorized to discuss and provide input on issues and projects that will impact the School System.

#### **FISCAL IMPACT**

This recommendation can be implemented with existing resources.

### **POLICIES AND PROCEDURES**

#### **OBSERVATION 10-H**

**The School System lacks documented policies and procedures to govern the support activities of the technical staff.**

Documented policies and procedures provide clear direction and guidelines to the technical staff on how to go about performing support activities. Without documented policies and procedures, technical support may be carried out in an inconsistent, ineffective, and insufficient manner. This could lead to performance issues with the School System's technology resources such as email, electronic file, and Internet access. Not having documented policies and procedures leaves the School System unprepared for emergencies and other problems that challenge the technical staff. Based on interviews with the technical staff, the School System has suffered some inefficiency in support because of lack of policies and procedures.

Also, documented policies and procedures provide the School System protection from loss of knowledge in the case of staff turnover. At the same time, the documented policies and procedures can facilitate assimilation of new staff or new assigned staff responsibilities in the most effective way.

The Technology and Information Services Department has developed a framework for departmental standard operating procedures. However, no documented department operational policies and procedures have been developed.

Sumter District Schools in Bushnell, Florida provides an example of a well-structured and comprehensive information technology policies and procedures manual. **Exhibit 10-20** and on the next page shows the Table of Contents for suggested content.

**Exhibit 10-20**  
**Sumter District Schools**  
**Information Technology Policies and Procedures Manual Table of Contents**

- I. PURPOSE
- II. ACCESS TO POLICY
- III. OWNERSHIP AND USE OF INFORMATION TECHNOLOGY RESOURCES
  - a. Technology Equipment
  - b. Software
- IV. GUIDELINES FOR THE USE OF TECHNOLOGY RESOURCES
  - a. Technology Acceptable Use
  - b. Network Security and Safety Guidelines
  - c. Access to Technology Resources
  - d. User Accounts
  - e. Passwords
    - 1. Disclosure of Passwords
  - f. Network Management and Security
  - g. Bandwidth
  - h. Hacking
  - i. Network Infrastructure and Communications Closets
  - j. Network Address Assignment and Dynamic Host Configuration Protocol (DHCP)
  - k. Domain Name Registration
  - l. Wireless Networks
  - m. Anti-Virus/Anti Malware/SPAM Control/Patch Management
- V. MOBILE DEVICE SECURITY
  - a. Policy Statement
  - b. Definition
  - c. Confidential Information
- VI. ELECTRONIC MAIL
- VII. WEB PUBLISHING
  - a. Responsibilities
  - b. Design and Development Guidelines
- VIII. DATA LOSS PREVENTION: NETWORK AND INSTRUCTIONAL TECHNOLOGY
  - a. Policy Statement
  - b. Backup Strategies
  - c. Physical Security
  - d. Confidential Information
  - e. Server and Storage Classification
- IX. SECURITY INCIDENT RESPONSE: NETWORK AND INSTRUCTIONAL TECHNOLOGY
  - a. Incident severity classification
  - b. Investigations
    - 1. Student
    - 2. Staff
  - c. Alerts and Advisories

Source: Sumter District Schools, Bushnell, Florida, July 2013.

**RECOMMENDATION 10-H.1****Develop policies and procedures to govern and guide technology support activities.**

The executive director of Technology and Information Services and his management team should identify functions and activities that require a policy or procedure to be effective. A plan should be developed to document and publish the documented policies and procedures incorporating standards, as appropriate. The policies and procedures should be written by the executive director and/or his designees. The written policies and procedures should be reviewed and approved by the Technology and Information Services management team. They should be included in the standard operating procedures manual and posted on the School System's and schools' websites.

**FISCAL IMPACT**

This recommendation can be implemented with existing resources.

## ALTERNATIVE SOURCING AND LEVERAGING OPPORTUNITIES

### LEVERAGING METROPOLITAN NASHVILLE GOVERNMENT

The review team explored whether there would be a strategic advantage to consolidating the School System's Technology and Information Services Department with Metropolitan Information Technology Services Department. We found that many of the discounted and free offerings afforded to school districts by various vendors such as Dell, Microsoft, and others would not be available if the School System's technology services were being provided by Metropolitan Information Technology Services Department. In addition, and most importantly, any equipment and services funded by the federal E-Rate program that is used to provide the communications and Internet access infrastructure for the School System can only be used by the School System. The federal E-Rate funds and the equipment and services purchased with those funds cannot be co-mingled. As a result, these benefits could not be realized if the two groups merged.

There are also issues related to providing support for the unique and time-sensitive requirements of the School System. A recent example is the requirement for the School System to have student email accounts. Metropolitan Information Technology Services would not allow student email accounts in their active directory. This situation led the School System to transfer email in-house thus taking advantage of a free Microsoft offering, Office 365, which not only satisfied the School System's email requirement but resulted in a reduction in email cost. The executive director of Technology and Information Services Department was quoted in EdTech magazine as saying, "With Office 365, we secured larger mailboxes for district users and gained antivirus and anti-spam protection, without spending a dime". After absorbing initial startup and transfer costs of approximately \$425,000, the School System's allocation for email hosting and support from Metropolitan Information Technology Services will be reduced by approximately \$500,000 per year.

Based upon the review team's assessment, there is no strategic or economic advantage to consolidating the School System's Technology and Information Services Department with the Metropolitan Information Technology Services Department.

The School System is currently leveraging Metropolitan Information Technology Services Department to provide its business applications (Human Capital, Payroll, Finance, Purchasing) using the Oracle Enterprise Business System (EBS). Based on the review team's assessment this arrangement should remain in place, but there are improvements to the service provided to the School System that should be addressed through the implementation of **Recommendation 10-G.2**.

Based on the review team's assessments, there is no other alternative sourcing or leveraging opportunities that would result in operational efficiency or cost-savings for the School System.

**FISCAL IMPACT SUMMARY**

RECOMMENDATION		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
<b>CHAPTER 10: TECHNOLOGY MANAGEMENT</b>								
<b>10-A.1</b>	Adopt a staffing methodology to assess and determine the appropriate staffing level for the technical support specialists required to provide adequate support to the schools.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-A.2</b>	Develop a staffing plan to address any staffing shortfalls as a result of the assessments using the adopted staffing methodology.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-A.3</b>	Develop key performance indicators with targets to measure the effectiveness of the technology support provided to the schools.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-B.1</b>	Research, assess, and develop a comprehensive five-year long-range technology plan.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-B.2</b>	Develop a detailed hardware migration and replacement strategy that would integrate with the five-year long-range technology plan.	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**FISCAL IMPACT SUMMARY (Cont'd)**

RECOMMENDATION		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
<b>CHAPTER 10: TECHNOLOGY MANAGEMENT</b>								
<b>10-C.1</b>	Appoint a dedicated technology security officer to ensure that its information security needs are met.	(\$70,000)	(\$70,000)	(\$70,000)	(\$70,000)	(\$70,000)	(\$350,000)	\$0
<b>10-D.1</b>	Develop plans to redesign and implement new websites for the School System and schools.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-D.2</b>	Redesign and implement new websites using SharePoint as the platform.	\$18,000	\$18,000	\$18,000	\$18,000	\$18,000	\$90,000	\$0
<b>10-E.1</b>	Establish a disaster recovery team.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-E.2</b>	Revisit the selection of the planned location to house the backup computing facility.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-F.1</b>	Develop a professional development and training program for the technical staff that would be incorporated into the performance evaluation process.	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**FISCAL IMPACT SUMMARY (Cont'd)**

RECOMMENDATION		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
<b>CHAPTER 10: TECHNOLOGY MANAGEMENT</b>								
<b>10-F.2</b>	Establish a training budget to ensure the technical staff has the appropriate knowledge and skills to perform their job responsibilities.	(\$95,148)	(\$95,148)	(\$95,148)	(\$95,148)	(\$95,148)	(\$475,740)	\$0
<b>10-G.1</b>	Form a task force of key stakeholders from the School System and Metropolitan Government to address and resolve issues with the Oracle Enterprise Business Solutions (EBS) that impacts the school district's requirements.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-G.2</b>	Develop a service-level agreement (SLA) between the School System's Technology and Information Services Department and Metropolitan Nashville Government's Information Technology Department based on input from the task force to ensure that support and services provided meet expectations.	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**FISCAL IMPACT SUMMARY (Cont'd)**

RECOMMENDATION		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL 5-YEAR (COSTS) OR SAVINGS	ONE TIME (COSTS) OR SAVINGS
<b>CHAPTER 10: TECHNOLOGY MANAGEMENT</b>								
<b>10-G.3</b>	Represent the School System's Technology and Information Services Department at all governance meetings held by Metropolitan Information Services Department.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>10-H.1</b>	Develop policies and procedures to govern and guide technology support activities.	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTALS-CHAPTER 10</b>		<b>(\$147,148)</b>	<b>(\$147,148)</b>	<b>(\$147,148)</b>	<b>(\$147,148)</b>	<b>(\$147,148)</b>	<b>(\$735,740)</b>	<b>\$0</b>

## Management Response

TECHNOLOGY MANAGEMENT

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
Management of Metropolitan Nashville Public Schools should:			
10-A.1	Adopt a staffing methodology to assess and determine the appropriate staffing level for the technical support specialists required to provide adequate support to the schools.	<b>Partially Accept</b> MNPS agrees with this recommendation and notes the district already has such a methodology. The Learning Technology Plan outlines the needs for staffing based on industry standards. The support: devices ratio that is recommended is not a realistic goal for the district.	Already in place
10-A.2	Develop a staffing plan to address any staffing shortfalls as a result of the assessments using the adopted staffing methodology.	<b>Partially Accept</b> See above. A more workable solution is to invest in technologies that will provide customer support.	Already in place
10-A.3	Develop key performance indicators with targets to measure the effectiveness of the technology support provided to the schools.	<b>Reject</b> The district already uses the Council of the Great City Schools' suggested Key Performance Indicators (KPIs).	N/A
10-B.1	Research, assess, and develop a comprehensive five-year long-range technology plan.	<b>Accept</b> The plan was developed during the 2012-2013 school year and is in implementation.	Already in place
10-B.2	Develop a detailed hardware migration and replacement strategy that would integrate with the five-year long-range technology plan.	<b>Partially Accept</b> MNPS agrees with this recommendation and notes that hardware migration and replacement is funded by the capital budget. Allocation of funds is based on Mayor and Council Approval. Funding is available for some years, but not in others. This makes it difficult to plan long-term. Current strategy is to use hardware until "end of life" and refresh as needed.	Already in place
10-C.1	Appoint a dedicated technology security officer to ensure that its information security needs are met.	<b>Accept</b> Funding for a security officer position will be included in the 2015-2016 Budget Request	July 2015
10-D.1	Develop plans to redesign and implement new websites for the School System and schools.	<b>Accept</b> Blackboard Engage has been selected by the Communications Department and Learning Technology Department as the platform for all new district and school websites. Rollout of the new district website occurred in late October 2014 with school websites being	October 2014 through August 2015

## Management Response

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
		upgraded over the next six months to a year.	
10-D.2	Redesign and implement new websites using SharePoint as the platform.	<b>Reject</b> After a thorough review of SharePoint and other web platforms, Blackboard Engage was selected by the Communications Department and Learning Technology Department as the platform for all new district and school websites. See 10-D.1 response.	N/A
10-E.1	Establish a disaster recovery team.	<b>Partially Accept</b> A disaster recovery plan does exist for the Department of Technology and Information Services. Development and implementation of a district level plan will require a commitment from all departments, as well as a dedicated FTE (possibly the Security FTE mentioned in 10-C.1).	Already in place
10-E.2	Revisit the selection of the planned location to house the backup computing facility.	<b>Accept</b> A cost/benefit analysis will be performed.	Summer 2015
10-F.1	Develop a professional development and training program for the technical staff that would be incorporated into the performance evaluation process.	<b>Accept</b> Plans are being formulated to address the professional support/training needs of all support personnel. The Technology & Information Services (TIS) Department will be included.	July 2015
10-F.2	Establish a training budget to ensure the technical staff has the appropriate knowledge and skills to perform their job responsibilities.	<b>Accept</b> Request for funding will be included in next budget year.	July 2015
10-G.1	Form a task force of key stakeholders from the School System and Metropolitan Government to address and resolve issues with the Oracle Enterprise Business Solutions (EBS) that impacts the school district's requirements.	<b>Partially Accept</b> The district will investigate the feasibility of this recommendation, which would require involvement of the district's Technology Information Services, Business Office, Purchasing, and Human Capital departments, as they are the primary users of EBS, as well as Metro Government ITS.	July 2015
10-G.2	Develop a service-level agreement (SLA) between the School System's Technology and Information Services Department and Metropolitan Information Technology Department based on input from the task force to ensure that the support and services	<b>Partially Accept</b> The Technology Information Services Department can assist with developing SLAs for the departments referenced in 10-G.1	TBD

## Management Response

TECHNOLOGY MANAGEMENT

	Recommendation	Concurrence and Corrective Action Plan	Proposed Completion Date
	provided meet expectations.		
10-G.3	Represent the School System's Technology and Information Services Department at all governance meetings held by Metropolitan Information Services Department.	<b>Accept</b> Metro Schools is now included in Metro ITS meetings where pertinent issues with potential impact to MNPS will be discussed.	January 2015
10-H.1	Develop policies and procedures to govern and guide technology support activities.	<b>Accept</b> MNPS agrees with this recommendation and notes the district has numerous policies and procedures in place to govern and guide the use of technology. They are reviewed annually to ensure they are kept current.	Already in place