



Online Testing
Technology Readiness Analysis
For
Bamberg School District 2

Overview of Bamberg School District 2



Bamberg 2 is located in the southwest part of the state with the District Office located in Denmark, SC. As of February 2016, the district is comprised of 3 schools, serving approximately 700 students. Test scores for students in grades 3-8 in the district were below the state average in all areas except Writing, but above their peer districts in all areas in 2015 and leadership is working aggressively to take the appropriate measures to enhance the learning experience and increase student achievement rates in 2016.

Key Data Points

- Dr. Thelma Sojourner has served as Superintendent for 4 years
- District Poverty Level is 94%
- Teacher Retention Rate is 81%
- Breakdown of schools:
 - Denmark-Olar Elementary, 70 years old, grades PK-5, 383 students
 - Denmark-Olar Middle, over 60 years old, grades 6-8, 141 students
 - Denmark-Olar High, 22 years old, grades 9-12, 183 students

Participating District Personnel

Name of District Staff Member	Roles/Responsibilities
Rodney Anderson	Director of Technology
Edwina Richardson	Contracted Tech Support

Purpose of This Analysis

The purpose of this analysis is to provide an independent evaluation of the ability of Bamberg School District 2 to organize and conduct online testing for their students in grades 3-8 starting in the spring of 2017. Federal online testing guidelines will take effect in 2018 but South Carolina's legislature has implemented plans for all districts to begin formal online testing in March of 2017 for Math and ELA classes inclusive of all students in grades 3-8. This proactive technology analysis will benchmark a district and their schools in several key areas and provide a technology readiness score that will ultimately lead to a roadmap of detailed tasks and deliverables that are necessary to improve any of the deficient areas.

The three specific objectives of this analysis are:

1. Analyze the strengths and weaknesses of the school district and quantify their ability to carry out the online testing activities in 2017 and beyond while documenting any major gaps in "readiness."
2. Work with the district to identify recommendations to bridge the gap between where the district is and where they need to be in terms of technology readiness to carry out these activities.
3. Collaborate with the district to put in place a blueprint for completing any tasks (or procurements) necessary to achieve "technology readiness."

Analysis Background

During the 2015 budget planning period, Superintendent Molly Spearman championed the General Assembly to consider the request of reserving a portion of the K-12 Technology Initiative funds for the purpose of providing technology technical assistance to rural and less affluent districts of need. After funds were allocated through the Proviso, the Superintendent's office called together a small Advisory Task Force to begin exploration of a plan of action to implement the initiative. The Task Force included South Carolina Department of Education (SCDE) staff, representation from rural school districts, legislative representation, and private sector.

The Proviso states:

"1.94. (SCDE: Technology Technical Assistance) Of the funds appropriated for the K-12 Technology Initiative, the department is authorized to withhold up to \$350,000 in order to provide technology technical assistance to school districts."

The purpose and spirit of the Proviso is for the SCDE to provide technology-consulting services ("technology technical assistance") to school districts that would otherwise struggle in securing such services and resources. In particular, consulting services would initially focus on evaluating the state of technology, in participating districts, as it relates to readiness for standardized, online assessments beginning in 2017 and the capacities to offer quality computing based instruction, including Wi-Fi availability for support of instruction.

Proposed District Participants:

While there are a substantial number of rural-based districts in the South Carolina public school system, funds allocated for this year's initiative may not be adequate to offer high quality and much needed external, independent consulting services to all districts of need. Therefore, it is recommended that initial focus be placed on the plaintiff districts involved in the lawsuit between districts and the state (Abbeville vs. South Carolina.) and any other rural districts identified by the State Superintendent's office. As time and funding are available, other rural districts may be included. There were initially at least 30 districts involved in the state suit and about 9 remained by the end of the suit. All of the original Abbeville Law Suit districts have been given the opportunity to participate in the Online Testing Technology Readiness Analysis.

Proposed Consulting Resources/Partners:

The South Carolina Department of Education did not have adequate staffing to fully offer technology consulting services of this magnitude. Therefore, it was suggested that SCDE seek and secure external, independent contracted services to facilitate this initiative. The state interviewed several industry-consulting resources and opted to leverage a lead consultant who helped the state with the analysis and writing of the Educational Technology Plan for years 2014-2017. Robert Cardelli was contacted in late 2015 and the consultant team was finalized and officially began work the second week of November 2015.

Initial Outcomes:

As a result of the initiative, each participating district receives a personalized report detailing the consultants' findings and recommendations as to the district's technology readiness for state and other online assessments, 1:1 computing, and enhanced Internet connectivity (Wi-Fi) for the support of instruction in their schools. A blueprint outlining specific steps the district and their schools need to focus on is presented to the district's superintendent as part of the final report.

Evolution of Online Testing Requirements

No Child Left Behind legislation required states to measure students' progress in reading and mathematics annually in grades 3-8 and at least once in grades 10-12 by 2005-2006. The *Every Student Succeeds Act* (ESSA) maintains the requirement that each state implement "a set of high quality student academic assessments in mathematics, reading or language arts, and science" (114th Congress, 2015, p. S.1177-24) among its provisions. Further, mathematics and reading or language arts assessments will be administered in each of grades 3-8, and at least once in grades 9-12.

Beginning in the 2014-2015 school year, learners faced a new testing challenge in that their assessments of learning will be via online testing of the Common Core standards. Assessments are being developed by organizations such as PARCC, DRC, ACT and SBAC. Tests may take learners from 8-10 hours to complete and must be integrated into the school's daily and weekly calendar of events to complete the necessary activities. (Doorey, 2014; Gewertz, 2013). Online testing has posed concerns about required technology, sufficient bandwidth, computerized test security, learners' technology skills, and new forms of test anxiety.

States Must Become Familiar with Updated Legal Policies for Computerized Testing

Computerized testing raises new issues that require updating of test security laws and policies, as policies written for standardized testing administered via paper-and-pencil are no longer sufficient. ACT has a highly relevant report in this regard: [The End of Erasures: Updating Test Security Laws and Policies for Computerized Testing](#) by Michelle Croft (2014).

Croft (2014) outlined many concerns, noting that computerized testing does not eliminate cheating and test piracy. Such practices just take on different forms. Unique risks include such things as educators logging in to tests to view questions or change student responses, computer hacking, keystroke logging, printing, emailing, or storing test information in a computer outside the test delivery system. There is a greater risk of students accessing the Internet and other programs during testing. There is great concern about students using their own devices for testing and who has administrative privileges. Technology staff and teachers need to consider how testing workstations need to be positioned and secured so that students can't see what's on the monitors of others.

Croft (2014) recommended that states update their state statutes and regulations to reflect the shift to computer-administered assessments, concentrate efforts on controlling test access, and ensure that there is a single test security section within the updated manual that contains answers for any question that a test administrator has about test security. For example, policies should consider how student login information is secured. There should be rules on how tests are reactivated if disrupted. Additionally, these rules should emphasize having more than one proctor aid in the reactivation, and most importantly, proctors should maintain a log of all reactivations to provide documentation in the event of an investigation. Likewise, the technology should be secure and the testing window should be as short as possible to reduce the likelihood that items are compromised. Finally, states should implement steps to actively monitor test access issues through data reports to determine if there have been excessive logins or logins at times when testing should not occur (e.g., on the weekends), and have clear policies in place detailing how violations will be handled.

The test security section should also include an itemized list of what materials are secure (e.g., work folders, student authorization tickets with IDs and passwords, session rosters, scratch paper, reference sheets). "Information about who can access the test should be clearly articulated across the school and communicated to all proctors on the day of testing. In addition, there should be information on how to report test security concerns and possible violations, which can be applicable regardless of the testing format" (Croft, 2014, p. 4).

It is vital for states to adequately prepare districts and schools for the evolving testing requirements and to proactively ensure educators and students are familiar with any new policies regarding computerized test administration, including what they, test proctors, and students may and may not do. Having these policies and procedures in place is critical to the success of the testing process and the legal implications for violating any of these policies are potentially severe. Advance planning and communication is required to minimize the risks associated with testing. Any technological failures in the administration of the tests could spark an outcry to invalidate the results; especially considering that high-stakes test scores are factored into school grades, teacher salaries, and federal assistance to the state. The stakes are too high!



Changes in E-Rate Rules Will Affect Funding for Districts

The federal E-Rate Program started redirecting funding support FY 2015 (7/1/2015-6/30/2016) to focus on high speed broadband connectivity and Wi-Fi to tackle the digital divide concern. This included no longer providing funding or reducing funding support for outdated, legacy, and non-broadband related services such as...Page 12 ref: https://apps.fcc.gov/edocs_public/attachmatch/DA-14-1556A1.pdf ***FCC Order 2015, 2016:http://www.usac.org/res/documents/sl/pdf/ESL_archive/EligibleServicesList-2016.pdf

Page 2 summary reads as follows:

“The E-rate program: (1) restructured the former Priority One and Priority Two categories into Category One and Category Two; (2) eliminated Category One (former Priority One) support for outdated, legacy, and other non-broadband services including web hosting, email, and paging; (3) adopted a phase out of support for Category One voice services; and (4) limited Category Two support to the internal connections needed to enable high-speed broadband connectivity within schools and libraries, specifically LAN/WLAN (local area networks/wireless local area networks)-focused components (broadband internal connections components), basic maintenance of eligible broadband internal connections components, and managed internal broadband services.”

Services and Components No Longer Eligible for Support (Effective Funding Year 2015)

Category Two (Priority One)	Category Two (Priority Two)
<p>Services and telephone components that were listed as eligible in the former Priority One category:</p> <ul style="list-style-type: none"> • 900/976 call blocking • Custom calling services • Direct inward dialing • Directory assistance charges • Email • Inside wire maintenance plans • Paging • Text messaging • Voice mail • Web hosting 	<p>Components included in these former Priority Two entries:</p> <ul style="list-style-type: none"> • Circuit Cards/Components • Data Protection (all except for firewall and uninterruptible power supply/battery back-up) • Interfaces, Gateways, Antennas (other than as specified in this Order) • Servers (other than servers necessary for caching) • Software (other than the software that supports eligible broadband internal connections) • Storage Devices • Telephone Components • Video Components • Voice/video IP components (that had been listed in the Data Distribution entry)

Many districts have relied on this funding support since the start of the E-Rate program 18-years ago. Some districts rely on this funding reimbursement to purchase additional technology/services. Others used this to pay for operational (staff, etc) expenses.

Eligible voice services are subject to an annual 20 percentage point phase down of E-rate support beginning in funding year 2015, as described in the *E-rate Modernization Order*. The reduced discount rate for voice services will apply to all applicants and all costs for the provision of telephone services and circuit capacity dedicated to providing voice services.

South Carolina’s Testing Requirements

The South Carolina College- and Career- READY Assessments (SC READY) are statewide assessments in English language arts (ELA)* and mathematics that will meet all of the requirements of Acts 155 and 200, the Elementary and Secondary Education Act (ESEA), the Individuals with Disabilities Education Improvement Act (IDEA), and the Assessments Peer Review guidance.

All students in grades 3–8 are required to take the SC READY except those who qualify for the South Carolina National Center and State Collaborative (SC-NCSC).

SC READY Assessments are not timed, and both computer-based and paper-based testing will be available. Data Recognition Corporation (DRC) is the contractor.

*** The ELA test will be a two-day test: Session 1 (Writing) and Session 2 (Reading) for all grades.**

Estimated Times for the SC READY Assessment*

Grades	ELA Session 1	ELA Session 2	Mathematics
3-8	2.5 hours	2.5 hours	2 hours

*The SC READY assessments are not timed. The Office of Assessment is providing estimated times to assist with classroom scheduling. Since there are no previous testing times to serve as a guide for SC READY, these estimates represent the Office of Assessment’s best approximations. “Start” and “Stop” times will be collected this year so that more accurate estimated times may be provided in the future. Please note that SC READY includes some new item types designed to measure a more demanding set of standards. As a result, it is anticipated that in the first year of SC READY, students may require longer testing times than in previous years.

Links:

- <http://ed.sc.gov/tests/middle/sc-ready/sample-items/>
- <http://ed.sc.gov/tests/middle/sc-ready/>
- <http://ed.sc.gov/tests/middle/adoption-list-of-formative-assessments/>
- [http://ed.sc.gov/scdoe/assets/File/tests/assessment-information/test-dates/SCREADYDates15-16\(1\).pdf](http://ed.sc.gov/scdoe/assets/File/tests/assessment-information/test-dates/SCREADYDates15-16(1).pdf)
- <http://ed.sc.gov/tests/elementary/general-information/>

Overview of Technology Readiness Analysis Team

A team of independent consultants has been hired by the State of South Carolina to conduct all aspects of this assessment. The objectivity that outside resources bring to the table has helped reduce the perception that “big brother” is searching for negative data points on a district’s leadership team. The use of third party resources has helped foster open and honest dialogue and allowed the district staff and consultants to collaborate in all aspects of the process. The team is comprised of the following individuals:

❑ **Rob Cardelli**

- Project Manager overseeing all facets of the analysis
- More than 20 years of education and government consulting expertise
- Personally worked with over 100 education customers including helping the Department of Education in South Carolina gather requirements and write the State’s Educational Technology Plan for years 2014-2017

❑ **Brenda Bryant**

- Local school teacher in Richland 2 school district
- Focusing much of her attention on the readiness of students and teachers along with professional development concerns

❑ **Bob Jones**

- Local I/T and Management Consultant with over 30 years of experience
- Focusing much of his efforts on the infrastructure, hardware, security and funding concerns
- Expert in data analytics and reporting

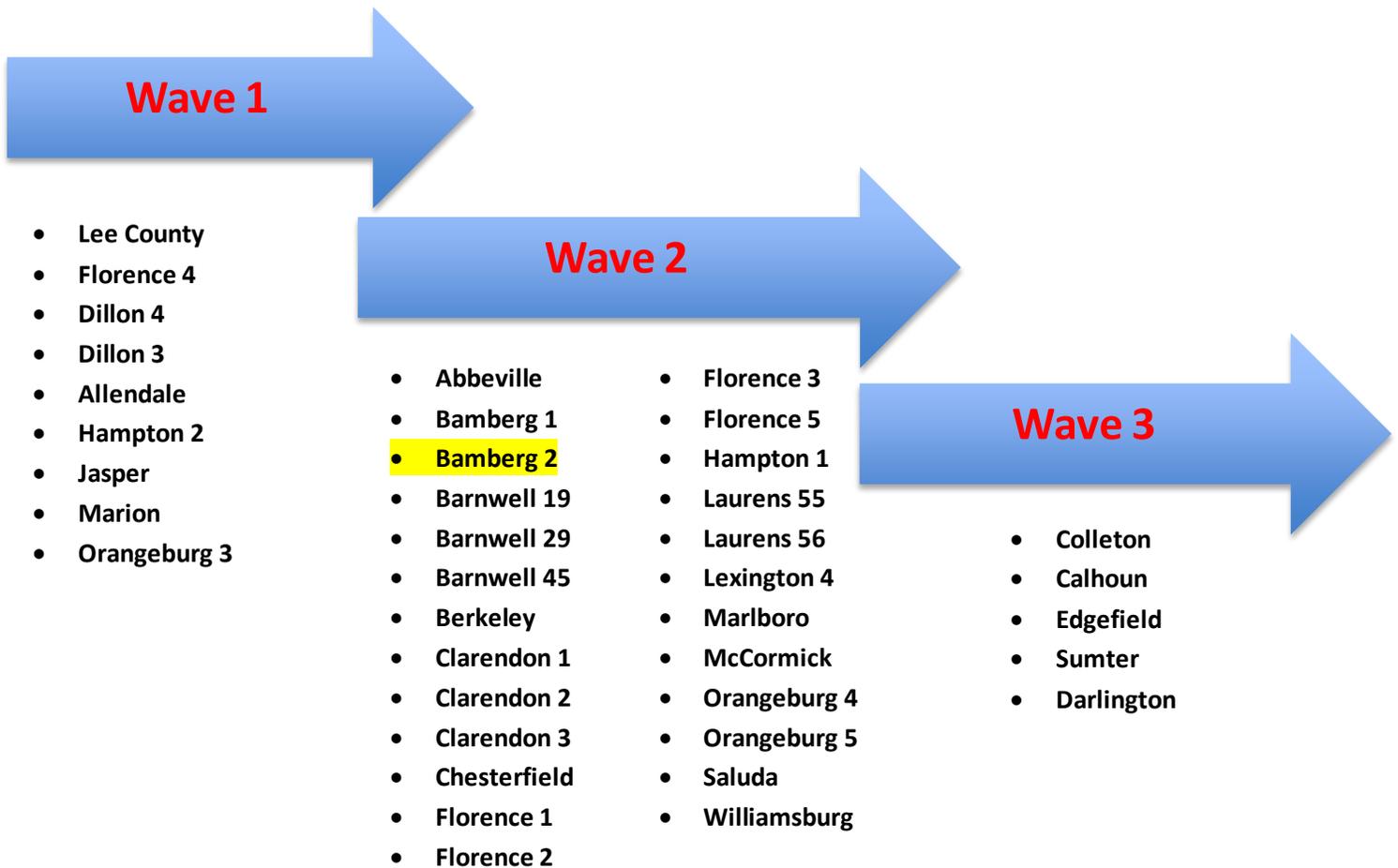
❑ **Heather Sutton**

- Local I/T consultant currently residing in the Orangeburg 4 district
- Focusing much of her effort on facilities, staffing levels, strategic planning and testing policy readiness levels
- Expert in data analytics and reporting

Participating Districts

The school districts that the state has identified as potential candidates for these optional readiness analysis studies have been prioritized into the following three categories:

- ❑ **Wave 1**- Includes the nine school districts that were still involved with the Abbeville Lawsuit at the time of the verdict
- ❑ **Wave 2**- Complete list of all districts participating in the Abbeville Lawsuit at any point in time over the last 20 years
- ❑ **Wave 3**- Other districts categorized as impoverished



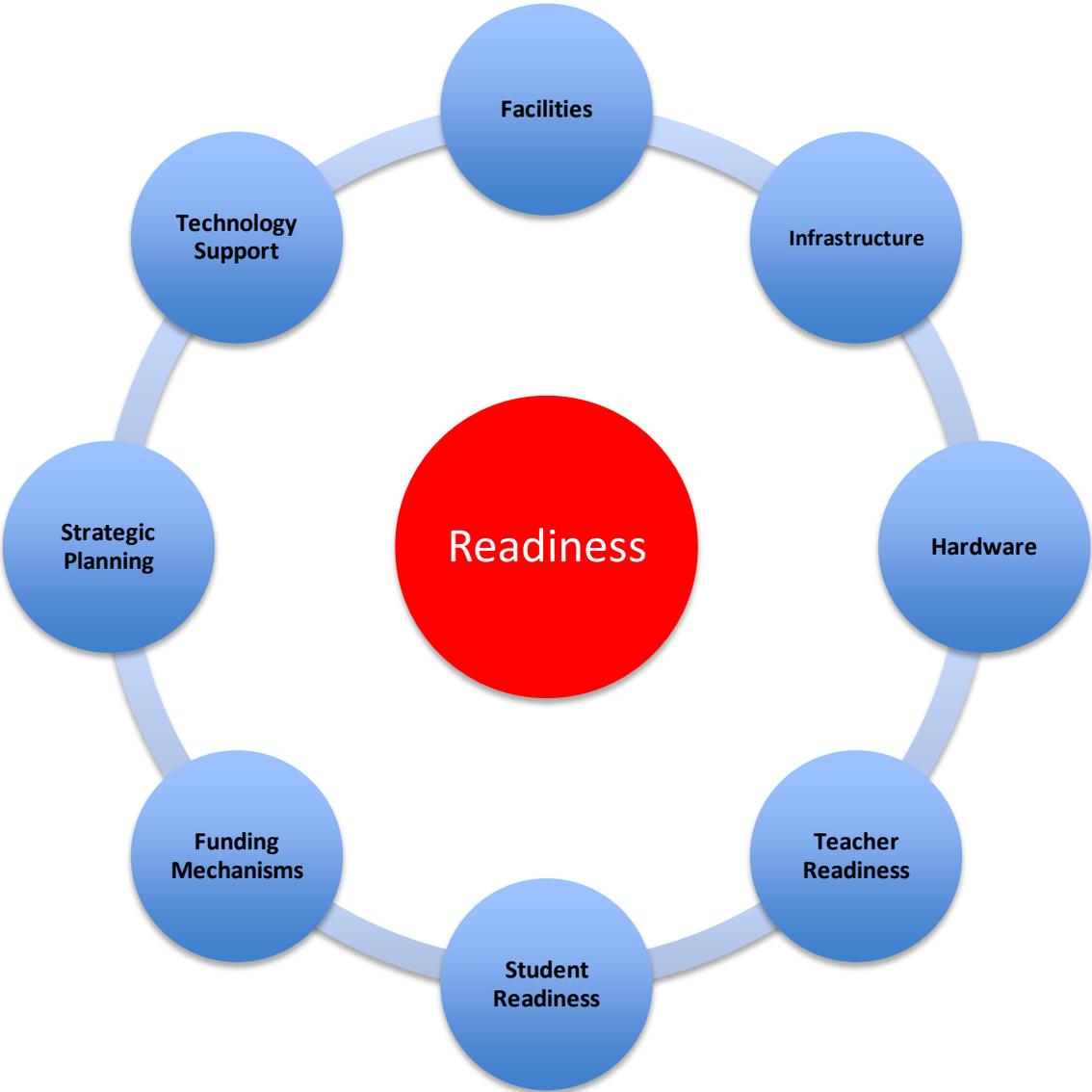
Analysis Methodology

The consultants worked with several of the Wave 1 districts to design and ultimately refine a methodology that allows for rapid data gathering with multiple collaboration opportunities for district staff to review the findings and edit the documentation to ensure the report accurately reflects the current state of the district. The consultants realize how busy the district staff are and created a methodology that is non-invasive in nature and flexible to allow the participants to work around their “day jobs” to reduce the impact on their daily operations.



Primary Areas of Focus

The technology analysis team identified several categories that are critical for a school district to achieve technical readiness for online testing. Within each category there are multiple variables that directly impact that category's degree of readiness. Accurately documenting these variables helps paint a picture of the overall level of readiness of the school district and also can be used to craft a blueprint for improving those deficient areas. The graphic shows the eight (8) categories currently being used to measure the degree of readiness. The following pages provide details surrounding the variables that are being analyzed during the analysis process.



Categories and Variables Being Measured

Note: These are generic categories and questions being asked are not specific to any one district. Each bullet point receives a score that is averaged for the overall section.

❑ Impact of Facilities

- How does the availability or lack of space impact the district's level of readiness?
- How does the age of the schools impact cabling, wireless, and ability to connect to the Internet?
- Does poor air conditioning or ventilation in server rooms, network closets, or computer rooms present a risk to the availability of the computers for testing?
- Are there situations where rodents chew through cables and bring down the district computer network? How long is the network down and what is the frequency of these events?
- Are there leaky ceilings, poor flooring, mold, or other environmental conditions that could impact the testing facility?

❑ Readiness of Infrastructure

- How does the amount of available network bandwidth impact the testing strategy?
- Are there any risks to testing due to the "up time" of the district (or school's) network?
- How many simultaneous testing machines can a district handle during any block of time?
- Does the district need additional wireless access points to conduct testing activities?
- Do the age and type of routers or switches impact the performance of the network and the ability of students to test in a given timeframe?
- Does the current wiring/cabling of the network impact the overall system performance? Is there anything that needs to be improved to enhance the testing experience?
- Is there any evidence that the security of the district's networks or computers could impact online testing?

❑ Readiness of Existing Hardware

- How does the number of available computers directly impact the district's ability to test?
- Is there a need to upgrade the available memory (RAM) in the testing computers? How much memory is currently in the testing machines and what (if any) performance issues have been witnessed?
- Are there any concerns over the size or quality of the testing monitors?
- Is there evidence that the different types of equipment being used for online testing directly impact the staff's ability to support the technology? Are there multiple products in use overcomplicating the support strategy and overall skills of the district staff?
- Do the current operating systems of the testing computers limit the ability to test? Are there any upgrades being planned and when will these take place?
- Are there adequate backup testing machines and/or accessories to ensure the necessary number of devices on the day of testing?
- Are there any procurements currently being contemplated and will they need to be amended to reflect changes to the testing strategy?

❑ Teacher Readiness

- Are the teachers adequately prepared for 2017 online testing requirements?
- Do the teachers require professional development training to educate them on how to better leverage technology?
- Do the teachers require assistance creating and conducting computer literacy classes for their students?
- Does the district have funding to offer computer literacy?
- What is the turnover rate of the teachers? How does the turnover rate impact the district's testing strategy?
- How do the teachers interact with the district technology staff?
- Are teachers aware of testing policies and are they properly prepared to manage testing cycles?
- Do the teachers need assistance in preparing their students for computer literacy?
- Are there any other concerns related to a teacher's knowledge or ability to assist with online testing?

❑ Student Readiness

- How does the level of computer proficiency of the student's impact online testing? Are there any concerns that students are not properly prepared to take a test on a computer?
- Does the district offer kindergarten through second grade computer classes?
- Is there any proactive analysis to identify disadvantaged students in a classroom with little to no computer literacy? What, if anything, is the district doing to help these potentially at risk students?
- Does the district allow students to check out computers to take home?
- How does a district manage situations where two different teachers leverage technology differently? Is there any analysis into the student's technology proficiency between these two scenarios?
- Does the district offer practice tests to allow the students to get familiar with the testing process and what is expected of them?
- Are students aware of testing policies and the implications?
- Is there any evidence from previous online testing cycles that students need assistance in specific areas? Examples might include: typing skills, knowledge of scrolling or potentially how to properly use a mouse.

❑ Technology Support

- How many resources are available at the district level and what are their roles and responsibilities?
- What are the main skills of the staff? Are there any skills missing in the support model?
- What functions are outsourced?
- What kind of help desk system is in place and how many ticket items are open?
- How many job duties does the staff have to perform?
- Does the district staff have any assistance from within the school?
- What would the impact be on the school's ability to test if a key resource were to call in sick or resign during the testing window?
- Are there any concerns about the availability of technology staff to support the testing process?
- Are policies and testing procedures documented and disseminated to all staff?
- Are students and their families made aware of the testing policies and schedule?
- Does the technology support team regularly communicate their needs to the administration and/or school board? What is the relationship between these parties?

□ **Funding Mechanisms**

- Does the district leverage all available e-Rate funds?
- How has the district utilized e-Rate funds in the recent past?
- Does the district have experienced grant writers?
- How have technology related grants been utilized in the recent past?
- Are there any funds from e-Rate or grants that have NOT been utilized but could be leveraged to help improve the overall readiness of the district for online testing?
- Who writes the e-Rate documentation and grants? Internal or external resources?
- Are there other sources of funds the technology staff has access to and for what are they used?
- How does the district determine how the funds will be utilized?
- Are there any situations where money earmarked for technology is denied and utilized for non-technical district needs?
- What is the role of the technology staff in setting budgets and preparing for online testing needs?
- Is there a formal mechanism for cross training multiple district staff in the rules, regulations and nuances of applying for e-Rate, grants or other funding sources?
- How are the district's funds allocated for student computer literacy being spent?

□ **Strategic Planning**

- Does the district have an up to date district wide strategic plan?
- Does the district have an up to date district technology strategic plan?
- Are the district's strategic plan and the TECHNOLOGY strategic plan properly aligned?
- What is the level of involvement of the local school board?
- Who is involved in strategic planning?
 - *Superintendent?*
 - *Teachers/Faculty?*
 - *I/T staff?*
 - *Local Vendors?*
- How does the district proactively plan for new technology acquisitions?
- How do the schools leverage district I/T staff?
- How are students or teachers leveraged?
- How are local technology vendors utilized?
- What is the level of involvement with the local "consortium"?
- How does the technology staff procure hardware or services?
- Is there a risk of "single point of failure" with the district staff member?
- Does the district need specific training in proper strategic planning?
- What assistance is required from the state?

Overview of Readiness Rating Scale

To evaluate the readiness of a district in multiple areas the team created a rating scale to objectively measure how effectively (or ineffectively) a particular area rates compared to other districts. After each area has been given a score the analysis team compiles the statistics and averages them to derive a final readiness score for the district. To simplify the process the consultants used a scale of 1-5 that increases in increments of half a point. The following scale will be used to track future readiness decisions:

Rating	Description
1	The district is unable to prove they can successfully complete online testing in 2017.
2	The district could feasibly conduct testing in 2017 but there are multiple areas that need to be improved to make this happen and if they are not completed testing will more than likely be unsuccessful.
3	The district will be able to meet the 2017 Online Testing requirements. The district will not be able to handle additional subjects or grade levels without significant improvement in multiple areas.
4	The district will be able to meet the 2017 Online Testing requirements and they can meet a few extra subjects or grades but not all future needs.
5	The district is prepared for 2017 and beyond. They do not have any measurable risks associated with Online Testing for 2017 or beyond. They can handle online testing for all grades and subjects.

Summary of Findings for Bamberg School District 2

Overall Readiness Score	2.2
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Impact of Facilities

Readiness Score	2.4
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Area of Focus	Observations	Recommendations
Availability of Testing Labs	<ul style="list-style-type: none"> The district currently has 7 labs, 4 of which are at the high school, 1 at the elementary school, and 2 at the middle school. Based on the numbers provided, Bamberg 2 has a sufficient number of testing seats to complete online testing within the testing window for 2017; however, if additional subjects or grade levels are added beyond 2017, this may not be the case. The district lacks the space to add additional labs for testing. 	<ul style="list-style-type: none"> Since Bamberg 2 does not have additional space for labs, if additional testing seats are required beyond 2017, the district will need to procure additional laptop carts in order to test online.
Age of Buildings and Impact on Cabling and Wireless Connectivity	<ul style="list-style-type: none"> Of the 3 schools in the district, 2 are over 50 years old and have challenges with the power supply. There are limitations to the technical capabilities of the buildings due to the lack of adequate power. Due to the age of buildings, the wiring capabilities and building materials used in these older buildings can present a challenge in upgrading the network. 	<ul style="list-style-type: none"> More power supplies will be needed for laptop carts, as well as extra batteries for the school that lack the power supplies. Administration should explore expanded power supply options and ensure backup systems are firmly in place.

<p>Environmental Concerns (i.e. mold, air conditioning and ventilation concerns, excessive noise)</p>	<ul style="list-style-type: none"> • All three schools have issues with leaks throughout the buildings. • Ventilation is a concern some data closets. • Network equipment is not secure in some areas. 	<ul style="list-style-type: none"> • Maintenance from the state department of education should have someone evaluate the schools to ensure there are no mold issues. • The leaks in the ceilings need to be rectified. • The data closets that need improved ventilation must be fixed. The risk of technology overheating and degrading or completely taking down the computer systems is very real and could impact testing. • Ideally, dedicated space needs to be identified to relocate equipment. If this is not feasible, the equipment needs to be contained in a locked cabinet to limit access.
<p>Condition of desks and chairs where students will be testing</p>	<ul style="list-style-type: none"> • Furniture in some labs is old and unmatched. While this might not seem like a major impact on testing there is evidence to suggest standard-testing environments must be in place to properly gauge the effectiveness of student testing. Students taking tests in rickety chairs or squeaky desks could be at a disadvantage. 	<ul style="list-style-type: none"> • A formal assessment of furniture in computer labs should be conducted to ensure all furniture is in good shape and appropriate for grades using the lab.

Infrastructure

Readiness Score	2.3
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Area of Focus	Observations	Recommendations
Available Bandwidth to the district	<ul style="list-style-type: none"> The district currently has 200 mbps bandwidth, which is the maximum amount funded by the state based on student count. 	<ul style="list-style-type: none"> The consultants recommend the district perform a formal analysis to determine if the available bandwidth is able to meet the needs of the district during online testing activities. Contracting with 3rd party experts may be necessary to ensure the routers, switches, access points and cabling are properly integrated and successfully maximizing the available bandwidth. Corrective action should be taken to further “tune” the networks and support components. There are specialized tools available to help assess a network’s efficiency and it may be necessary to leverage a 3rd party to help justify purchasing additional incoming bandwidth to rectify the performance challenges.
Stability of Networks Within The Schools	<ul style="list-style-type: none"> Currently the district has 1 wireless access point for every 2 classrooms. The network appears to be in good shape. The Director of Technology is doing an excellent job with the limitations he faces. 	<ul style="list-style-type: none"> Additional analysis is required to determine whether or not the buried network cables are adequately protected. The disruption due to rain/thunderstorms is a concern and needs to be examined. The performance issues that take place during peak testing hours need to be monitored and network hardware potentially expanded to allow for more efficient network usage. The consultants recommend engaging a local state approved contractor to assist with quantifying and further defining the issues.

<p>Available Bandwidth to the Schools</p>	<ul style="list-style-type: none"> • Each school has 150 mbps coming in from the district. There is not enough data to determine the potential performance challenges the schools may face. 	<ul style="list-style-type: none"> • As more subjects and grades are added to online testing, performance testing will need to be conducted at each school location to determine how much bandwidth is needed. The district currently believes there could be a risk to testing the current population but they lack the tools to confirm any challenges. Additional network hardware might be needed to expand the capacities and efficiency of the district’s network.
<p>Cabling Challenges</p>	<ul style="list-style-type: none"> • All lines coming into the district are cat 6. • Some areas have cable that has degraded. • Due to the age of most buildings, cabling has been a challenge. The schools have done the best they can, given the structural challenges, but it’s a very challenging situation and there are clear issues with the network connectivity and what can be accomplished due to these limitations. 	<ul style="list-style-type: none"> • The consultants recommend the district engage a firm to formally evaluate the network cabling challenges and provide a cost comparison between going heavily wireless or continuing to invest in the hardware cabling. • As the demands on the network increase, the district should consider upgrading to Cat 6 or fiber, if feasible. • ***PER ASBUILTS CREATED BY LAST CABLING VENDOR- CABLING IS CAT 6 AT SCHOOLS***
<p>Wireless Networks</p> <ul style="list-style-type: none"> • Routers • Access Points • Bandwidth • Switches 	<ul style="list-style-type: none"> • The district currently has 1 access point per every 2 classrooms. As more classes and subjects are added, access points may need to be added in every classroom. • The age of the switching gear appears to be factoring into some of the performance issues. • All switches in the district need to be on a replacement cycle. 	<ul style="list-style-type: none"> • Load testing to see if more access points are needed. • Replace all older switches in the district. • Increased bandwidth should be explored once the other hardware issues have been addressed. The new hardware should be able to accommodate significantly more bandwidth. It’s important to do the hardware first and THEN the expanded bandwidth.

Hardware

Readiness Score	2.3
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Area of Focus	Observations	Recommendations
Number of Computers Available for Testing	<ul style="list-style-type: none"> Bamberg 2 has approximately 75 computers in testing labs used in grades 3-8. The district also has 172 laptops that could potentially be used for testing, Based on the number of students in the district, Bamberg 2 currently has a sufficient number of computers to complete online testing within the testing window. 	<ul style="list-style-type: none"> A hardware refresh plan needs to be created. The district currently does the best they can but a formal plan needs to be created to handle the future management and philosophy towards consistently replacing district technology. Back up hardware and equipment, such as batteries needs to be available during testing. It is mandatory that backup systems exist or the risk to students not being able to test is very real.
Age and ability to upgrade computers	<ul style="list-style-type: none"> All computers are between 2 to 5 years of age. As computers reach the end of their useful life, a replacement strategy must be identified. 	<ul style="list-style-type: none"> A consistent and well thought out technology refresh strategy should be created and approved by the superintendent and communicated and approved by the school board.
Available RAM (Memory) in testing computers	<ul style="list-style-type: none"> All computers have 4 GB of RAM. 	<ul style="list-style-type: none"> The consultants recommend the district strive for a minimum of 8 GB of memory on all future computers. Wherever possible we suggest trying to upgrade the existing computers IF it's a cost effective solution. Many times adding memory to an existing computer is NOT necessarily cost effective if you can buy a brand new laptop with a faster processor for a price of half as much as simply adding memory to an older machine. Careful analysis is needed to ensure a proper strategy is implemented.

Disaster Recovery Solution	<ul style="list-style-type: none"> The district is currently working on a disaster recovery plan. A plan has been conceptualized but not implemented. There is currently a backup solution but it's not a "cloud or offsite" model, which is a very real risk. 	<ul style="list-style-type: none"> The consultants recommend Bamberg 2 collaborate with their peers in other districts who also need remote disaster recovery solutions to obtain a discounted vendor contract. A formal DR policy and plan is needed and the consultants believe the state government should have a role in providing assistance in this area. The majority of districts interviewed have an immediate need in this area. The state should recognize this risk and assist with identifying and implementing and supporting a DR solution
Adequate replacement hardware	<ul style="list-style-type: none"> The district does not currently have a replacement plan for hardware. We have mentioned this concern elsewhere. It's imperative that the district and schools have adequate machines for testing. 	<ul style="list-style-type: none"> Purchase and maintain a healthy supply of backup machines, batteries, keyboards and mice. Create a formal hardware replacement policy.
Support and Replacement Strategy	<ul style="list-style-type: none"> Currently the district does not have a technology refresh policy. Funding is not predictable and purchases are made when funds are available. 	<ul style="list-style-type: none"> A formal strategic planning initiative is needed to review the current state situation and identify needs for the district in a variety of areas outside the scope of this assessment. The district staff has the skills to complete this assessment internally however, they don't have the time. The consultants recommend a formal plan be created to ensure infrastructure and computers are modernized on a consistent basis.

Teacher Readiness

Readiness Score	2.3
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Area of Focus	Observations	Recommendations
Technical Proficiency of Staff	<ul style="list-style-type: none"> The district does not have a Technology Coach. Staff development is offered, but professional development classes are offered intermittently. Teachers are comfortable with the technology they have available. Additional technology training is welcome but not readily available due to resource (people, money, and time) constraints. 	<ul style="list-style-type: none"> Once the formal testing requirements are finalized the district needs to ensure all teachers are notified of testing requirements and any professional development promptly scheduled. Additional professional development is warranted but must be accompanied by a formal plan on how and when to leverage the training resources. The teachers should be held accountable by administration to take the training and utilize the lessons learned in their job functions.
Turnover of Teachers	<ul style="list-style-type: none"> Due to the location and the lack of industry in the area, many teachers that are not from the area tend to leave the district after 2 years. Teachers have not expressed that technology is a reason for leaving the district. The turnover of staff directly impacts the technology staff. The tech staff uses their limited training time/budget to get teachers up to speed on how to use technology and they routinely leave the district. The new teachers coming in are unable to take training because in many cases the professional development resources (people and money and time) are exhausted. 	<ul style="list-style-type: none"> The state should explore avenues for reducing the severe turnover rate in this district. It is putting the district and the schools and the students at a competitive disadvantage. Additional professional development is needed to ensure new teachers coming in to REPLACE outgoing teachers are properly trained. A study should be conducted to determine the impact on the students when teacher turnover rates are so severe.

Level of Technical Preparedness	<ul style="list-style-type: none"> • Many teachers have a positive outlook regarding technology in the classroom. Additional training would be beneficial and there is evidence this is needed. 	<ul style="list-style-type: none"> • Teachers should be surveyed to determine what type of training would be welcomed. • The addition of a Technology Coach is warranted.
Availability to prepare for testing	<ul style="list-style-type: none"> • Online testing requires significantly more preparation than paper testing. The Director of Technology is the sole member of the technology department with assistance from the part-time contractor. Preparation for online testing will result in a much greater demand for his time. 	<ul style="list-style-type: none"> • District leadership needs to mandate dedicated time is allocated to focus on preparing for state and federal testing activities. The IT staff needs to be involved to ensure all tasks and deliverables are completed in an efficient manner.
Other Concerns	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

Student Readiness

Readiness Score	2.4
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Area of Focus		
Availability of Computer/Typing Classes for K-2	<ul style="list-style-type: none"> K-2 students have the opportunity go to a computer lab once a week but do NOT have formal computer literacy/keyboarding classes. 	<ul style="list-style-type: none"> Keyboarding instruction needs to start prior to the 3rd grade. Formal keyboarding activities are necessary to ensure 3rd graders are prepared for the testing requirements.
Level of Poverty/Home Exposure to Computers	<ul style="list-style-type: none"> Bamberg 2 has a poverty level of approximately 94%. Many families in the area do not have internet services. Students' exposure to the internet is largely through the school or a smart phone. There is a very real concern that students in this district may be at a competitive disadvantage over their peers in neighboring districts due to their high poverty rates, lack of computer proficiency at earlier ages and the lack of exposure to technology in the classroom. 	<ul style="list-style-type: none"> The fact that many of the district's students come from homes where heavy and consistent computer usage is unlikely only increases the need for formal computer literacy classes in the earlier grades. The district should seriously explore giving the aging technology to the local families to allow students to become more familiar with keyboards and utilizing mouse.
English as a Second Language Concerns	<ul style="list-style-type: none"> The district has 7% ESL students. Practice tests are already being delivered to these students. 	<ul style="list-style-type: none"> The consultants recommend the district staff continues to work closely with the schools to formally give the ESL students an opportunity to take a practice test to ensure they are adequately prepared for testing activities. Simulated testing will help identify any potential concerns in a proactive manner.
Availability of Sample Tests	<ul style="list-style-type: none"> The district currently does online sample testing. 	<ul style="list-style-type: none"> DRC offers free sample tests that could be used to further familiarize students with the online testing format.
Other Concerns		

Funding Mechanisms

Readiness Score	2.1
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Area of Focus	Observations	Recommendations
Maximizing e-Rate	<ul style="list-style-type: none"> Bamberg 2 does not apply for e-Rate. The Director of Technology has expressed to the consultants that he has discontinued applying for e-Rate due to the lag time between applying for funds and the approval and release of funds. He also expressed concerns over the government's strict regulations regarding the usage of funds. 	<ul style="list-style-type: none"> We recommend Bamberg 2 work with an e-Rate consulting firm, to ensure the district does not leave potential funds on the table.
Ability to successfully manage the grant writing process.	<ul style="list-style-type: none"> The district does not have a dedicated grant writer; however, Bamberg 2 has been awarded several grants. 	<ul style="list-style-type: none"> We recommend collaborating with neighboring districts to share a resource to assist in this area. This is a common solution in many states
Multiple resources knowledgeable in e-Rate and Grant Writing	<ul style="list-style-type: none"> Bamberg 2 does not have anyone on staff that can fill out e-Rate other than the Director of Technology. 	<ul style="list-style-type: none"> Multiple district staff needs to be familiar with the e-Rate process for checks and balances and backup scenarios. A 3rd party contractor should be identified as a potential source of knowledge.
Other Concerns		

Strategic Planning

Readiness Score **2.3**

Area of Focus	Observations	Recommendations
Technical Staff Collaborates with Administrative Staff to Determine Technology Needs	<ul style="list-style-type: none"> The Director of Technology informs the administrative staff of the district’s needs for upgraded technology. The administrative staff is extremely supportive of the recommendations that come from the Director of Technology. 	<ul style="list-style-type: none"> Best practices dictate that the technology staff regularly updates the school board on technology usage and needs.
Thoughtful analysis into how funds will be spent	<ul style="list-style-type: none"> The technology staff has certain plans in place to build the correct technological infrastructure that is needed in the district. 	<ul style="list-style-type: none"> Continued strategic planning efforts are required. Communicating to the school board and ensuring all parties are aware of the importance of consistent funding for technology and professional development is mandatory.
Teachers needs are considered top priority	<ul style="list-style-type: none"> The district does a consistent job focusing on the needs of the teachers and their needs. 	<ul style="list-style-type: none"> No recommendations are needed in this area.
The role of technology is agreed upon by all parties	<ul style="list-style-type: none"> All ideas and suggestions are brought to the attention of the Director of Technology. This position is well respected by all areas of the district and IT is actively engaged in all decision-making processes. Administrators and staff understand they must have everything approved through the Director of Technology. 	<ul style="list-style-type: none"> No recommendations are needed in this area.
Proper amount of professional development	<ul style="list-style-type: none"> The district does not offer classes for professional development. 	<ul style="list-style-type: none"> The district needs to engage with other peer districts to formulate a professional development plan. Survey teachers to see what would draw them to the professional development sessions.

**Implementation,
Distribution and
Enforcement of Testing
Policies.**

- State testing policies are provided to test proctors. State testing policies are followed in testing rooms.

- Everything dealing with online testing must be coordinated with the Director of Technology and the testing coordinator.

Readiness of Technical Staff to Support Online Testing

Readiness Score	1.6
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Area of Focus	Observations	Recommendations
Number of support technical support staff	<ul style="list-style-type: none"> The Director of Technology has 1 staff member in the department. He is heavily involved in the day-to-day support of the district technology. The district has hired a technology consultant to relieve some of the duties of the Director of Technology. 	<ul style="list-style-type: none"> As online testing grows, Bamberg 2 will need to increase the technology staff. Currently it takes the entire staff to man online testing district wide. Help desk tickets increase during current testing due to the lack of help. Formal details of roles and responsibilities are needed to help map out where additional skill sets might need to be inserted into the support model.
Technical skills and proficiency of support staff	<ul style="list-style-type: none"> The director of technology has many years of IT experience. He has worked in many school districts and understands the needs of IT in the school district. The consultant worked for Bamberg 2 for many years before stepping into her current role. She has many years of technology experience. 	<ul style="list-style-type: none"> Retention must be a focus for district leadership. Losing any of these key IT resources could cause significant damage to the existing support model. The district needs to find time and money to get the technology support personnel into formal technology training courses so they can stay modern in their technical skills.
Availability of staff to proactively engage with the teachers and administrative staff	<ul style="list-style-type: none"> The Director of Technology is also over technology support, PowerSchool tech support, Financial Services, and Transportation. He has very limited time to help plan or come up with new ways to incorporate technology in the classroom. 	<ul style="list-style-type: none"> Administration needs to pay attention to hours worked and burnout. The existing staff appears to be working significant overtime. This is a risk and needs to be monitored. Having resources inside the schools serve as the front line for help desk items might be needed. Training of school resources OR students could help reduce the help desk ticket volume and free up I/T staff to be more strategic.

<p>Ability of staff to assist with professional development efforts</p>	<ul style="list-style-type: none"> • The Director of Technology is overwhelmed with daily tasks and the amount of help desk tickets. • The Director of Technology wears so many hats, he has no choice but to work late, on weekends and even give up vacation time in order to get the job done. 	<ul style="list-style-type: none"> • Additional professional development resources (people, money, time) are easily quantifiable and should be made available to the technology department.
<p>Risk of Single Point of Failure. If a key resource leaves will testing become at risk?</p>	<ul style="list-style-type: none"> • The Director of Technology is also over technology support, Financial Services, Transportation, and Powerschool. He has very limited resources. He is from the area and has a vested interest in the success of the district. • If the Director of Technology were to be unavailable to work during the testing periods (sick or quit) there is a risk to the district of being able to successfully conduct testing. 	<ul style="list-style-type: none"> • The district must focus on cross training and documenting roles and responsibilities. • The need for an additional technology resource is easily quantifiable. • The Director of Technology must identify the skill sets needed to fill the needs of the district.

Additional Consultant Observations

Highlighted below are the most frequently cited strengths of the school district, which can be used as a foundation for creating a roadmap to address any areas of concern. The items in the table are rank-ordered according to the frequency with which they were mentioned in the interviews. Multiple points of engagement took place with a minimum of two analysis team members involved with every district.

Rank	Strengths	Common Themes
1	Willingness to improve	Everyone in the district strives to work together to see that improvements are made not only yearly, but on a daily basis.
2	Attitude / Enthusiasm	Bamberg 2 makes the best of all situations. The attitude of the district is whatever it takes to get it done, they will do it.
3	Work well together	The entire district is more than co-workers, they are a family unit. They thoughtfully plan and execute everything in the best interest of the children of Bamberg 2.
4	Dedication	The technology staff gives up many hours with family and friends to ensure every staff member and child has the up to date technology and teachers know how to utilize the tools in their classrooms.

Commonly Cited Concerns

Listed below are the most frequently cited concerns about testing that were documented over the course of the analysis process.

Rank	Concern	Sample Answers
1	Budget	The technology department has a very limited budget. Without careful planning the district may not be able to upgrade or refresh hardware as needed each year.
2	Schedule / timeline	Bamberg 2 technology staff is stretched thin. They have very limited time to plan far in advance due to daily operations.
3	Staffing Levels and Workload	This is a major area of concern. Currently the Director of Technology manages everything for technology. If something happens to him, the district will face many challenges with testing.
4	Lack of Professional Development	New or upgraded technology will require significant training. There are limited funds available for professional development and the district needs at least one more support resource to help with technology training.
5	Disaster Recovery	Like most districts, a backup is done of the system, however nothing is offsite or in a cloud.

District's Inventory of Readiness Needs

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Facilities	Space/Testing Rooms							
	Air Conditioning Unit							
	Roof/Ceiling Repair							
	Desks							
	Chairs							
	Other							

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Infrastructure 125	Bandwidth	500mbps	ATT	1		\$9,600		Prior to 2017
	Routers							
	Switches	REPLACE ALL EXISTING 10/100 LAYER 2 SWITCHES	Meraki	DO:1-48/3 48 POE/1 SFP MODULE DOHS:4-48/2-48 POE/1-24/6-24 POE/4 SFP MODULES DOMS:1-48/3-48 POE/3-24/2-SFP MODULES DOES:1-48/3-48 POE/5-24/2-SFP MODULES	133,855.00	3,235/5 years	TBD	ASAP
	Access Points	replace APS (aruba) with Meraki for 1:1 initiative	Meraki	DO: 5/DOHS: 32/DOMS: 24/DOES: 35	76,504.00	450/5 years	TBD	NEXT 6-12 MONTHS
	Cabling	add cable runs for add'l AP's		15-30 district wide \$250/drop	6,250		TBD	
	Installation/Testing							
	Disaster Recovery	online backup for a critical servers	intronis	22 servers	295	295/month		
	Other							

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Hardware	Laptops	laptop replacement district wide for student laptops	HP	100	96,900	N/A	GRANT	
	Desktops	DESKTOP REPLACEMENT FOR LAB AT MIDDLE SCHOOL	HP	25	22,475	N/A	GRANT	
	Memory	4 GB sticks	Crucial	300	7,500.00	n/a	TBD	
	Operating System Upgrade							
	Monitors							
	Computer Carts (Cart Only)			6	6,000		TBD	
	Extra Batteries		Dell/HP	100	1,000		TBD	
	Installation/Testing							
	Other	replace analog phone system with VOIP system - district wide	Creative Solution	have quote if needed	2396.97	2321.97/month	budget	ASAP
	Other	replace hard drives with solid state drives	n/a	100	7,900.00	n/a	TBD	

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Teacher Readiness	Type of training needed by grade and by topic							
	Teacher's Knowledge of Online Testing Requirements including security							
	Other	District Tech. Coach		1		75,000	TBD	

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Student Readiness	Computer Literacy Curriculum	Typing Quest from SC Virtual Schools – preK-6 th Grade	SCDOE		Free			
	Computers needed for training							
	Practice Tests							
	Other							

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Funding Mechanisms	Assistance/Training for Writing Grants							
	Assistance/Training to manage e-Rate	contracted e-rate consultant	?		?	?		
	Other							

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Strategic Planning	Consulting Assistance to educate staff in the strategic planning areas							
	Formal Training of Staff							
	Other							

Category	Specific Need	Detail Specific Need (As required)	Vendor	Quantity	Estimated Cost (One Time)	Estimated Recurring Cost	Potential Funding Source	Date Needed
Technical Support	Consulting Assistance to help in specific areas							
	Additional resources	FTE for add'l staffing – 2Techs		2	100,000	100,000/yr	TBD	Asap
	Other							

Strategic Roadmap

This section will provide an overview of the specific action items the district should focus on to improve the readiness of each area discussed in this report. The Roadmap is broken down into measurable tasks and deliverables to

1-Month Plan

- Purchase student keyboarding curriculum if additional funding is provided
- Acquire contracted grant writers if additional funding is provided

3-Month Plan

- Order additional bandwidth if additional funding is provided
- Review backup/restore procedures
- Hire additional technology support staff if additional funding is provided
- Explore solutions to maximize bandwidth during testing windows ie load testing, segmentation.
- Target professional development opportunities for technology staff throughout upcoming school year if additional funding is provided

6-Month Plan

- **Replace/refresh layer 2 switching district wide – reliant on available funding**
- **Add additional AP's to allow for 1:1 initiative – reliant on available funding**
- Pursue cloud backup storage solution if additional funding is provided
- Update hardware replacement plan

12-Month Plan

- Order teacher desks, chairs, counter tops for additional space/testing rooms if additional funding is provided
- Order switches, wireless access points for additional space/testing rooms if additional funding is provided

18-Month Plan

- Install teacher desks, chairs, counter tops for additional space/testing rooms if additional funding is provided
- Install switches, wireless access points for additional space/testing rooms if additional funds are provided

APPENDIX

Pictures of District



Data Closet



Leaky Ceiling



Mismatched Lab Furniture



Network Equipment Room