

Albemarle County Public Schools



Departmental Efficiency Update



Efficiency Snapshot

The Department of Accountability, Research, and Technology

Human Resource Alignment

November 1st the Department of Accountability, Research and Technology reorganization began to align its human resources with the division's vision, mission and goal of providing engaging 21st century learning environments.

Capital Resource Alignment

Purchasing practices have been aligned to leverage resources and ensure the long term health and stability of the division's technology systems.

Fiscal Resource Alignment

While funding has decreased \$1,000,000 from last year's budget, the Department of Accountability, Research, and Technology has made the necessary provisions to continue to meet the needs of students and staff. Current funding only allows the division to maintain service, not expand. Further cuts will result in a loss of services.

Service Design and Strategy for Continual Improvement

The department has adopted an internationally recognized information technology governance framework. This framework allows the division to systematically approach the service life cycle and provide best practices in meeting the division's vision, mission, and goals.

Building Internal Capacity

The division's technology related needs go beyond hardware, software, and bandwidth. We must ensure both instructional and technical staff have adequate access to the necessary tools and professional development in order to best serve the students of Albemarle County.

How is Technology transforming Education?

Teachers facilitate Albemarle County learners to engage daily in meaningful work using a variety of learning tools including computer devices. This learning work derives from the Framework for Quality Learning developed in 2003 to provide guiding principles for the division's Pk-12 concept-centered, standards-based curricula, contemporary pedagogy, and performance-driven assessment.

Alignment of the core learning work of students, teaching practices, and learning tool applications to support the Division's Vision, Mission, Goals, and Lifelong Learning Competencies is critical for graduates to be prepared to successfully enter adult citizenship, college, and the workforce. Staff members in the Department of Accountability, Research, and Technology now are organized to more effectively and efficiently integrate their services so that educators and learners receive timely support to accomplish contemporary learning work.



For example, ESOL (English as a second or other language) teachers at Burley Middle School recognized an opportunity to transform iPods into a learning tool to assist student language acquisition. Language dictionary applications allow students to always have within reach a tool they can use to lessen language barriers in content they encounter in and out of school. Elementary, middle and high school students use iPods as voice recorders for research, video cameras to create documentaries, and netbooks to gain immediate access to information on the Internet. Students use e-readers such as the Kindle to access library collection at Red Hill Elementary and Jack Jouett Middle School. At Murray High School where the school does not have a traditional library space, staff and students now have access to a robust set of resources through e-readers.

Crozet Elementary students blog routinely about classroom activities and engage in online discussions with peers in and out of the classroom. Students across the county including Brownsville and Meriwether Lewis Elementary, Albemarle High School, and Walton Middle School have utilized social learning media such as Skype to interact with subject matter experts and gain international perspectives. Students receiving special education services have been able to increase accessibility of learning resources through the use of speech-to-text and text-to-speech software and virtual applications.

Technology continues to evolve; today we see a vast differentiation of tools available for instructional purposes. Andy Johnston, a gifted teacher at Stony Point Elementary remarked, "we need to plan for both the consumption of information and the production of information by selecting the appropriate tool." This statement speaks to the need to provide a variety of technologies available for students to consume and create content. We are at a pivotal time where it is more important than ever to make wise decisions to select the best tool for the job. Today that tool could be a mobile device such as an iPod or iPad. Or, it could be a student response system, a book, a laptop, or a pencil.

The range of technologies available as learning tools in contemporary classrooms spans the 20th and 21st centuries. These tools allow learners and teachers to select the resources they need to best address the curricular standards and objectives that students must master to be academically successful. Today, students are being expected to demonstrate their achievement through the new online version of Virginia's Department of Education Assessments being phased in across the state as well as Albemarle's local performance-driven assessments being piloted this year as an alternative to selected-response testing.

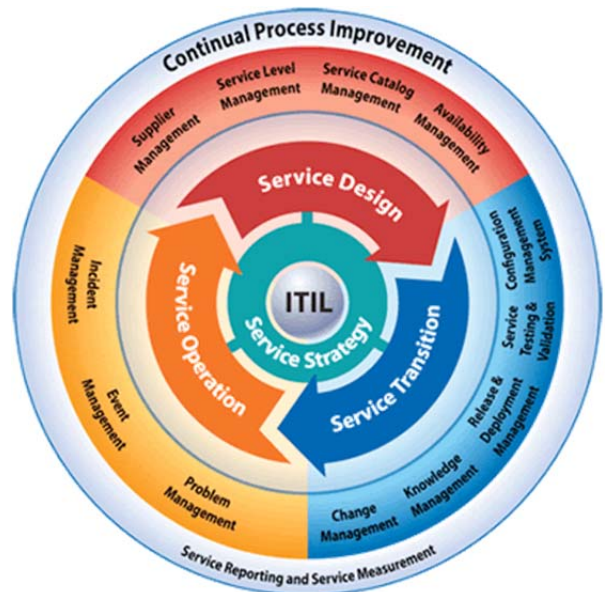
This report addresses multiple areas of service delivery, the cost of maintaining and sustaining services, and the challenges of offering quality services, providing the resources that educators request as needs, and the research and development necessary to continue to implement appropriate and wise technology acquisitions that systemically advance learning work.

Service Design

On November 1, 2011, the Department of Accountability, Research, and Technology (DART) began to transition to a new service delivery model design. The primary objective of the new service delivery model is to be client-focused. DART is a service oriented department that supports the instructional and business objectives of the division. The first step of this transition was to reorganize the department. The new department organizational design creates functional teams which work collectively to provide both utility and warranty of technical services. The reorganization eliminates technical silos and process inefficiencies that previously existed. Furthermore, the new framework will enable the division to build human capacity and develop deeper understandings of technologies.

As part of the reorganization, DART adopted the Information Technology infrastructure Library (ITIL) service model. ITIL provides a comprehensive, consistent, and coherent set of best practices for IT Service Management Processes, promoting a quality approach to achieving business effectiveness and efficiency in the use of information systems.

The diagram to the right displays the five components of ITIL – Service Strategy, Service Design, Service Transition, Service Operation, and Continual Process Improvement. There is a strong correlation between this operational framework and the quality improvement model that is currently utilized in the division. With a new service model and organizational structure in place, standard operating procedures and process charts are being developed in order to obtain the most efficient services.



As the reorganization evolves, DART is simultaneously applying ITIL best practices and developing new processes for services offered to the division. As part of the design process, services have been mapped to a product life cycle based on the maturity of the product and their contract deadlines. This allows DART to function in a systematic fashion. The chart below the Service Life Cycle:



DART's Functional Areas



The services that DART delivers to the division are Instructional (Educational Technology and Professional Development), Assessment and Research, Enterprise Applications, Infrastructure and Support Services, and Client Support Services.

Educational Technology and Professional Development

The division's vision to empower students to take ownership of their learning, to excel, and to own their future inspires the use of technology as a tool to enhance student-centered, inquiry-driven learning. By developing and promoting innovative strategies for staff to integrate technologies into the learning process, the division continues moving forward with its mission to establish a community of learners and learning through rigor, relevance, and relationships, one student at a time.

Research and Accountability

Analyzing student performance data to produce district accountability reports, data summaries, and responses to requests for performance data are the primary functions of the Research and Accountability team. This team also develops and distributes descriptive and statistical information about school data from formative and summative assessments administered by the division. In addition, the team designs, prepares, and maintains various data reports and serves as a data resource for district, local, state, and federal agencies. The division uses SchoolNet to develop and administer formative and summative assessments. The information below is a snapshot of the use of SchoolNet by the division in the last year:

- In the 2010-2011 school year there were 1,203 tests administered through SchoolNet Assess
 - o 143 were district-level assessments,
 - o 960 were school based assessments, and
 - o 100 were classroom based assessments.
- Of the division's 12,800 students, 10,015 students took at least one assessment in SchoolNet.
- The total number of student assessments delivered and scored in SchoolNet was 28,541.

Enterprise Applications

The Enterprise Application team develops and maintains the enterprise databases and related services. Utilizing enterprise data architecture management, the team can extract, transfer, and load data, construct and maintain a data warehouse and provide data mart services. The collection of the

enterprise applications enables the division to utilize business intelligence and data mining services. The team conducts performance tuning and database maintenance on all enterprise applications ensuring the deployment, maintenance, and support of databases that the division relies on to deliver high quality instruction.

Infrastructure and Support Services

Infrastructure and Support Service is the engineering department of DART. The Network Engineers maintain the voice and data services for the division. Infrastructure management is sometimes divided into categories of systems management, network management, and storage management. The division's Service Desk Engineers are responsible for the division's incident management, deployment management, and system configuration management.

Infrastructure and Support maintains:

- Approximate number of servers: 160 in service; includes two datacenters and building servers, of which approximately 60 are virtualized servers, and 40 are virtual machine host systems.
- Number of wiring closets: approximately 200, with per closet port capacity ranging from 24 to 192, fiber backbone running at 1Gbps or higher between closets in a single site.
- Number of access points: in excess of 400 (an average of one 802.11b or better AP per four classrooms) currently deployed with a total number of 1,350 targeted for this summer.
- Number of IP telephones: in excess of 2,300.
- Number of PSTN trunk circuits: 184.

Client Support Service

Client Support is critical for division staff and students to perform in today's learning environment. Client Support Specialists are providing technological solutions and advocating for information technology fixes in a highly-energized, team-focused environment. The Client Support team provides the division with customer service concerning information technology initiatives implemented by DART to meet the teaching, learning and research needs of the division.

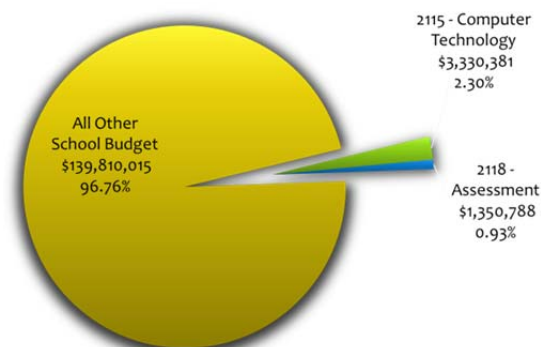
Client Service Specialists are supporting the division by working for successful incident resolutions. Below is a sample of this month's issues and resolutions caseload:

Incident Status Summary for November	
Closed Tickets	495
In Progress Tickets	349
New Tickets	22
Re-Opened Tickets	2
Waiting for Third Party Tickets	27
Waiting for User Feedback Tickets	12
Total Tickets	907

Current Budget

The division allocates 3.33% of the overall budget to support the services delivered by DART. This percentage is broken into two funds: Computer Technology – Fund 2115 (2.30%) and Assessment – Fund 2118(0.93%). Additionally, there are other funding sources through the Capital Improvement Plan and the Virginia State technology grant.

As a measure of fiscal prudence, all expenditures are evaluated to assess their organizational importance. Additional spending controls have been implemented to ensure that all expenditures from supplies to servers have been reviewed and approved prior to acquisition. A review of the department's procurement procedures revealed some ineffective practices. In the past, procurements were made throughout the course of a year on an ad-hoc basis. Additionally, individual departments and schools were negotiating with technical vendors independently without the involvement of DART and procuring technology. This practice of distributed purchasing did not allow the division to leverage its buying capacity.



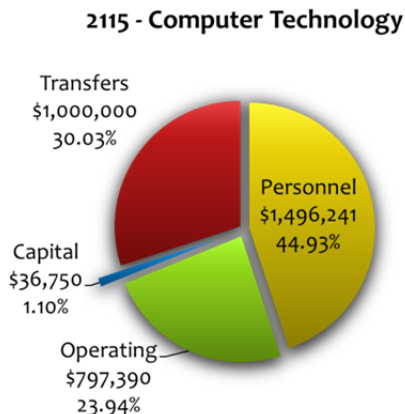
In the spring of 2011, both practices were remedied. All technical purchases are now processed through DART, allowing the division to streamline the process, allow for proper asset management, and increase purchasing power. The second major alteration was to align the purchasing timeline with the critical timeline in the vendor business cycle. By aligning purchases at the end of major vendor business cycles, we have increased leverage in negotiations. This practice has yielded the division the opportunity to obtain more services for less money. This change has also allowed the division to purchase a higher quality laptop with a longer warranty while reducing the overall cost of the device by \$80. Annually the division purchases 700 devices. This equates to a cost savings of \$56,000. The monies gained from this efficiency were then applied to address deficiencies in other areas within the division. By aligning purchasing, deployment of laptops has been expedited. In the past it would take DART staff two months to prepare computers for deployment into classrooms once computers arrived from the manufacturer. Now machines are configured, inventoried, and assets assigned at the manufacturing site allowing machines to be deployed for student use within 2 weeks of arrival.

Schools, PTOs, and other departments have found it necessary to supplement school technology purchases because of a lack of overall funding. Over the course of the past two years, departments, schools, and PTOs have purchased more than \$300,000 worth of technology equipment and hardware not including software purchases. This type of localized spending has led to inequities throughout the division and increased the difficulty on DART staff to maintain additional devices and accurate inventories.

Fund 2115 – Computer Technology

This funding source provides resources necessary to carry out the business of school. Nearly half of the operating monies pay for telecommunications and data services for the division. The operating account also supplies all major technical systems necessary for the business of schools like web filtering, Email, SPAM filtering, major software licensing (i.e. Microsoft) , and division-wide services (i.e. Blackboard). Also funded are all replacement and repair costs associated with maintaining nearly 8,000 computers and 7,000 other technical devices.

In the 2011-2012 school year, this budget saw a reduction of \$1,000,000 in equipment and a reduction of 4 FTEs as a result of ARRA funding expiring.

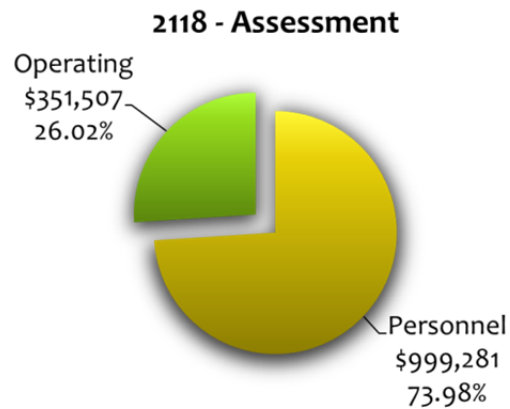


44.93% of the Computer Technology fund is allocated to staffing 21 FTE positions. This staff provides the technical services to the division. Staff members included in this fund are the Manager of Client Services, the Lead Client Service Specialists, and the Client Service Specialists who provide direct support within the buildings. It also provides funding for the FTEs associated with the infrastructure and support service group including Network and Service Desk Engineers. An area of concern is the level of staffing at the Client Service level because currently there are 4 FTEs funded with one-time money.

An initiative for the Board in the 2012-2013 budget is to increase the operational FTEs from 21 to 27. The additional 6 FTEs include the 4 FTEs that are funded with one-time money in the current year. While we have made organization changes to be more efficient, this staffing allocation will allow the Client Service Specialist ratio to be reduced from 1:1200 to 1:1035.

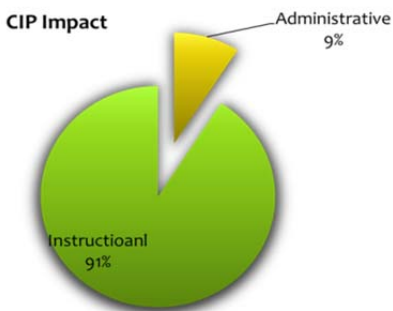
Fund 2118 – Assessment

73.98% of the funds associated with the Fund are directly tied to the salaries of 11 FTEs. The remaining balance supplies the funding for the division's enterprise applications and monies associated with division wide assessments. The enterprise applications funded in the operating account are the Student Information System, Assessment Management Systems, Curriculum Managements System, rapid communications system, and library management system.



Efficiencies have been found in the review of past practices. After reviewing the licensing cost with Microsoft products, DART abandoned one-time purchases of software and is moving to a campus licensing agreement. This transition was cost neutral but has given the division licensing rights for all devices that the division owns. It also provides software assurance, which allows the division to migrate from one application version to another without paying any additional cost. This now allows DART to migrate all users to a consistent platform, allowing Client Service Support to be more efficient in meeting the needs of staff.

Capital Improvement Plan (CIP) Funds



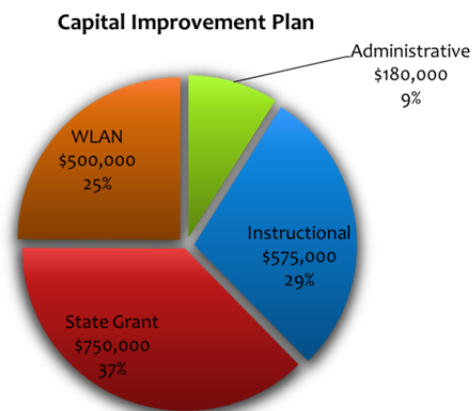
Nearly all funding for technology equipment purchased by the division comes from outside the division's operating budget. This funding source is through Albemarle County Capital Improvement Plan. These funds follow a separate process outside the normal school budget. The State's technology grant is administered through the CIP program. 91% of the funds from CIP go directly into the schools and classrooms.

There are four designations of the CIP funds: the Wireless Local Area Network (WLAN) upgrade, State Grant for classroom technology, the instructional technology, and administrative technology.

The WLAN funds are associated with an initiative to upgrade the wireless capabilities in the division's sites to support the wireless devices currently within the system. It will also allow for scalability in the future if the demand should increase. The funds are for the wireless equipment as well as cabling services. This will greatly increase the staff and students' capacity to gain access to valuable resource anywhere on school campus. This project is scheduled to be completed by the start of the 2012-2013 school year.

100% of the State Grant monies go directly to the division's computer refresh cycle. The division is required to keep and maintain a minimum a 5:1 student to computer ratio. These monies paired with the Instructional Technology monies from CIP enable the division to maintain a 3:1 student to computer ratio. Teacher laptops are also funded from the instructional account of CIP.

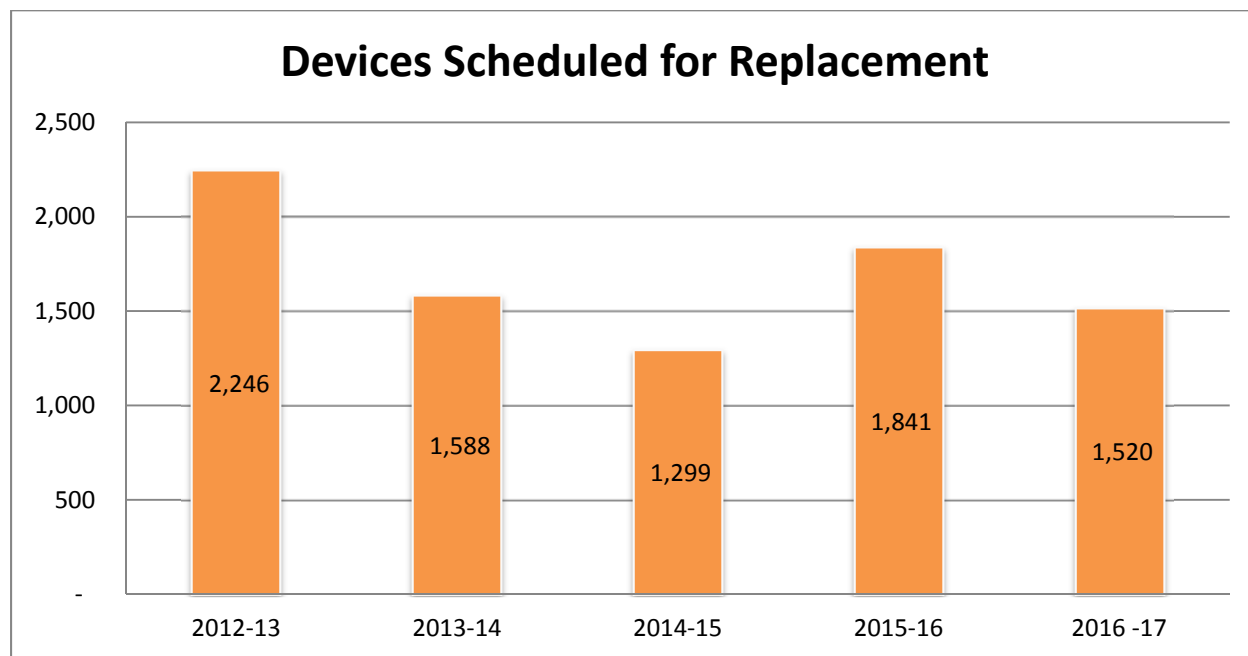
One of the goals of DART is to normalize the refresh cycle so that each year we are consistently purchasing the equal amount of devices necessary to meet the demands. Past practice has been very erratic in the procurement of classroom technologies.



Challenges in the Near Future

There are a series of challenges the division faces in the near future. First is the inadequate amount for technical staffing to support 30 sites, nearly 15,000 users, and 15,000 devices. Despite efficiencies in the service model and streamlining operational processes, it will be exceedingly difficult to meet the demands of a 21st century learning environment. Another major area of concern is the lack of systematic professional development associated with educational technologies and integration practices.

In the 2012-2013 budget proposal, a funding initiative will be submitted to the Board to allocate \$150,000 towards instructional technology staff development. This initiative will allow each teacher to participate in 3 hours of professional development related to instructional technology.



The chart above illustrates the projected needs for computer replacement purchases over the next five years in response to fluctuations in prior year computer purchases. The current budget allows for the procurement of 1200 computers annually on a 4 year replacement cycle. DART is continuing to look for efficiencies in other spending categories to address the gaps for replacement needs and budgeted capabilities until the replacement cycle can be normalized.

In the spring, DART will perform a series of audits to ensure all resources are being utilized to capacity including a print study/audit and a phone line audit.

Appendix:

An example of learning work that is correlated to the Division's Life Long Learning Standards and the Division's Educational Technology Plan.

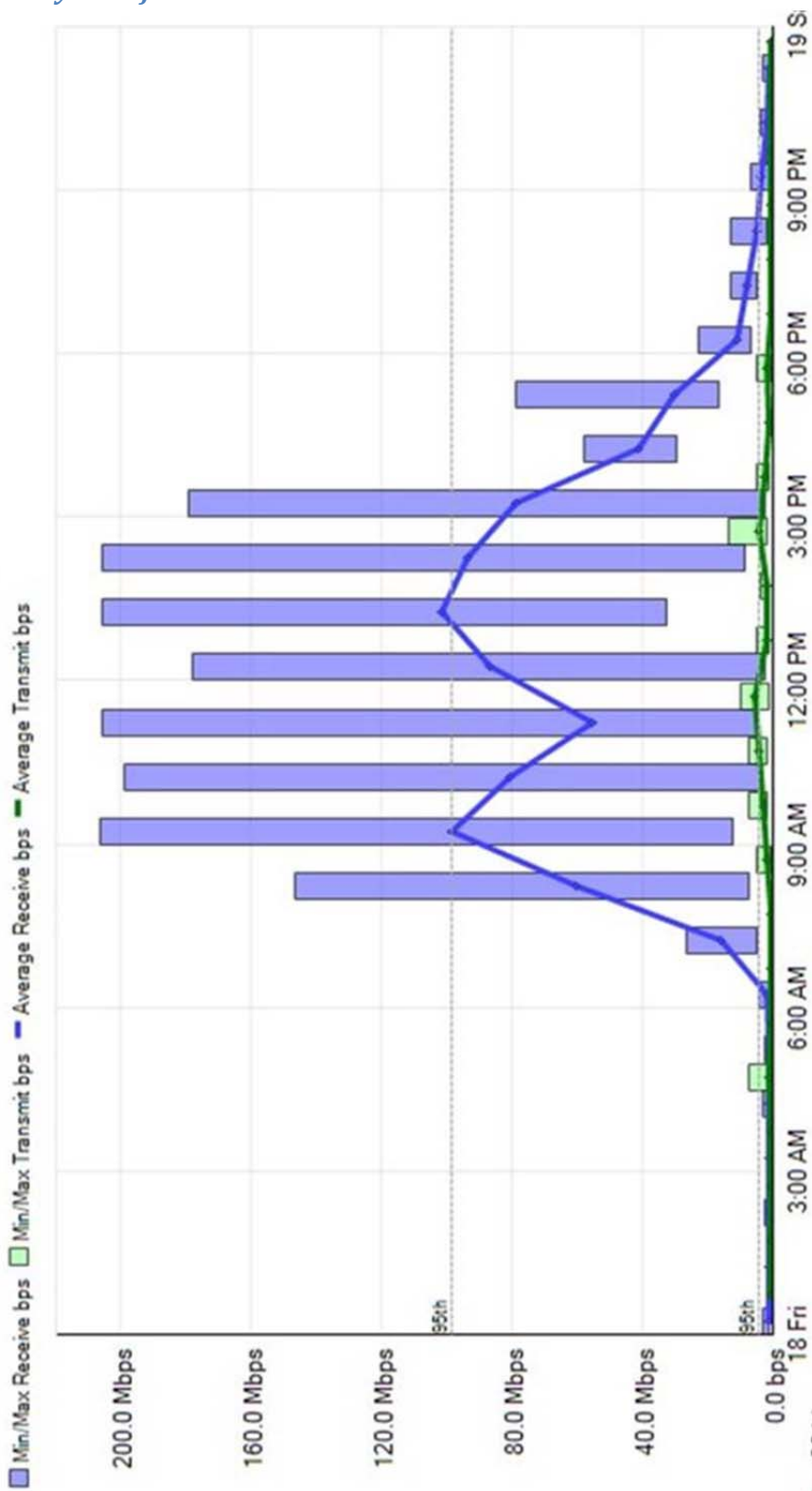
Lifelong Learner Competencies	Illustrative Examples from ACPs	Ed Tech Plan Objectives Related to the Examples
Plan and conduct research.	Students at Meriwether Lewis are using Today's Meet and other social media tools to conduct research and check for understanding.	Objective 1.1: Deliver appropriate and challenging curricula through face-to-face, blended, and virtual learning environments.
Gather, organize, and analyze data, evaluate processes and products; and draw conclusions.	Students at Henley Middle School produce oral history videos, often interviewing grandparents and other family members.	
Think analytically, critically, and creatively to pursue new ideas, acquire new knowledge, and make decisions.	Government students at WAHS use a class set of iPods to research current events and to support other research endeavors.	
Understand and apply principles of logic and reasoning; develop, evaluate, and defend arguments.	Students at Crozet Elementary have published iPod app reviews for teachers throughout the world to use.	Objective 4.3: Identify and disseminate information and resources that assist educators in selecting authentic and appropriate tools for all grade levels and curricular areas.
Seek, recognize and understand systems, patterns, themes, and interactions.	Students at Brownsville Elementary charting weather, exploring Google Earth for Social Studies projects, and using Animoto to create video productions.	Objective 5.3: Promote the use of technology to inform the design and implementation of next generation standardized assessments.
Apply and adapt a variety of appropriate strategies to solve new and increasingly complex problems.	Students at Cale, Crozet, Baker-Butler, Jouett, and MESA and exploring digital fabrication in the classroom.	
Acquire and use precise language to clearly communicate ideas, knowledge, and processes.	ESOL students at Burley and Jouett use dictionary apps and voice memos to learn new words and practice fluency.	
Explore and express ideas and opinions using multiple	Computer Science students at WAHS created an app to pull data	

media, the arts, and technology.	from a variety of school-related calendars and iPod app development will be incorporated in to future CS I courses. Students at Stony Point and Stone-Robinson have scripted and produced audio tours of their nature trails or other community spaces.	
Demonstrate ethical behavior and respect for diversity through daily actions and decision making.	Immigrant students at AHS produce iMovies about their families, culture, and lives and celebrate these in a class showing of them all.	
Participate fully in civic life, and act on democratic ideals within the context of community and global interdependence.	Students at Greer Elementary are using the Voice Memo app for Reading and Virginia Studies to record themselves and adults involved in the Massive Resistance.	
Understand and follow a physically active lifestyle that promotes good health and wellness.	Students at Henley Middle School use apps to learn about health and fitness matters.	
Apply habits of mind and metacognitive strategies to plan, monitor, and evaluate one's own work.	Students at Murray High School report reading more and different literature on their Kindles than they did in years past. Students at Red Hill and Yancey are learning from audio books and other literacy apps. Students at Yancey Elementary are using PC tablets to improve fluency and increase reading comprehension.	Objective 2.2: Actualize the ability of technology to individualize learning and provide equitable opportunities for all learners.

Average Daily Use of Bandwidth

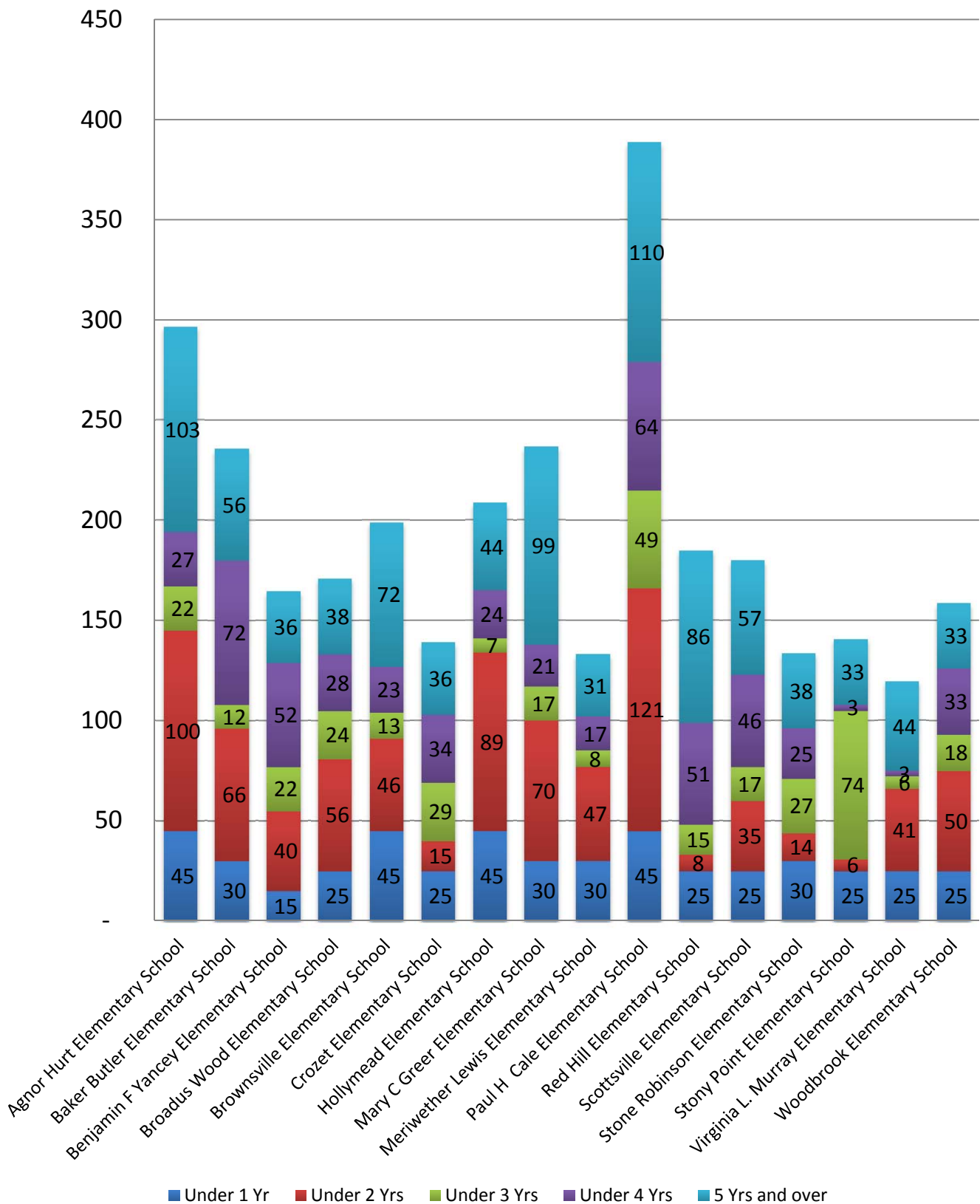
ACPS-EMBARQ - GigabitEthernet0/1 - Gi0/1

Min/Max/Average bps of Recv 200.0 Mbps Xmit 200.0 Mbps
11/18/2011 12:00:00 AM~11/19/2011 12:00:00 AM

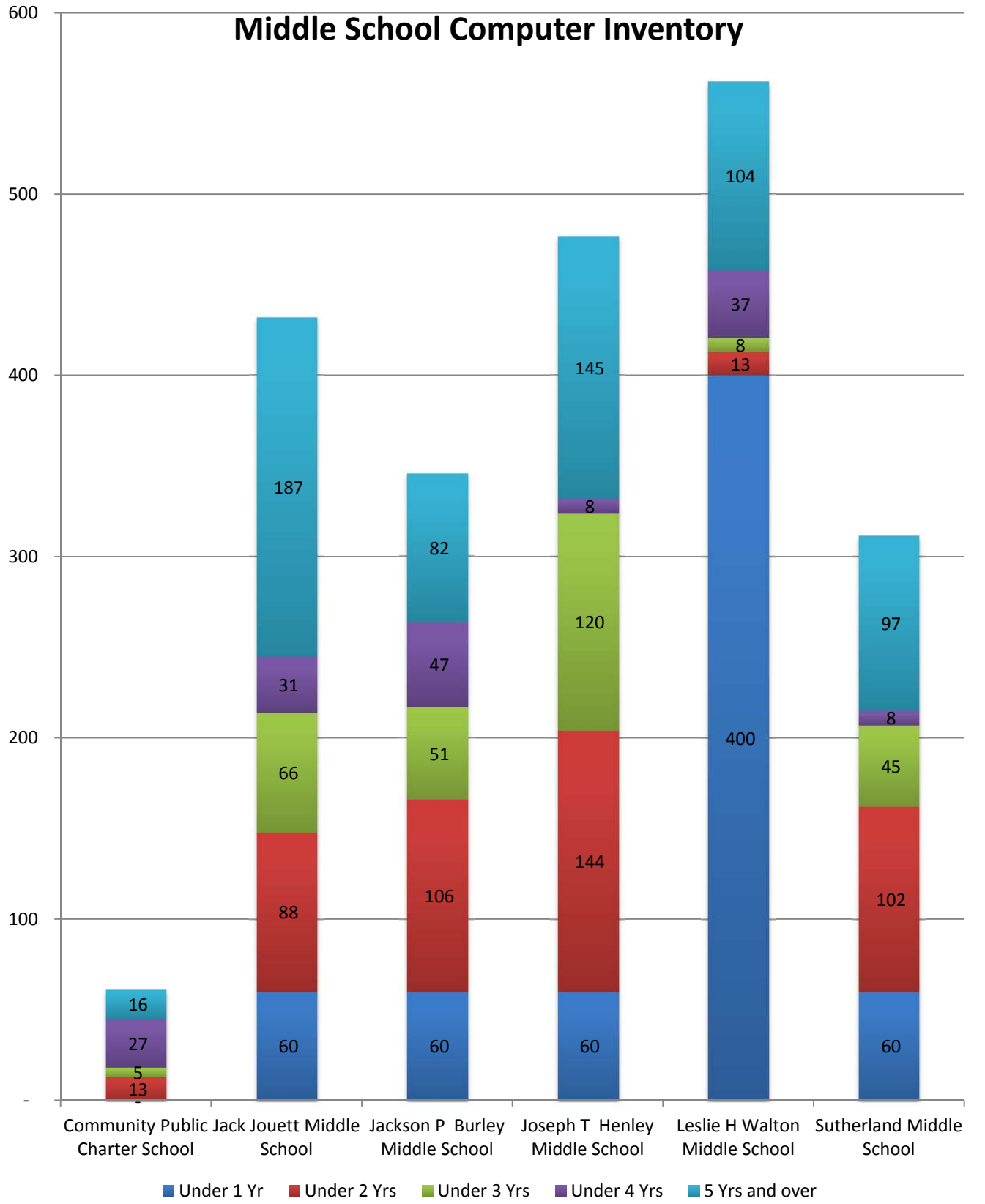


Nov 2011
95th Percentile: Average Receive bps is 98.5586 Mbps, Average Transmit bps is 4.2866 Mbps
SolarWinds Orion Core Services 2011.2

Elementary Computer Inventory



Middle School Computer Inventory



High School Computer Inventory

