Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Report to the North Carolina General Assembly

School Connectivity Initiative

SL 2007-323 (HB 1473), SECTION 7.28.(d)

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NC DEPARTMENT OF PUBLIC INSTRUCTION
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SCHOOL CONNECTIVITY INITIATIVE
Legislative Update

Submitted to:

Joint Legislative Oversight Committee on Information Technology

Joint Legislative Education Oversight Committee

Office of State Budget and Management

State Chief Information Officer

Fiscal Research Division

Prepared by

Connectivity and E-rate Services Section
Technology Services Area
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FOREWORD

The School Connectivity Initiative (SCI) was created by *Session Law 2007-323 SECTION 7.28.(d)* as follows:

> *SECTION 7.28.(b) As recommended in the Joint Report on Information Technology, February 2007, the State Board of Education shall contract with an entity that has the capacity of serving as the administrator of the School Connectivity Initiative and has demonstrated success in providing network services to education institutions in the State. The funds appropriated in this act shall be used to implement a plan approved by the State Board of Education to enhance the technology infrastructure for public schools that supports teaching and learning in the classrooms. The plan shall include the following components:*
>
> *(1) A business plan with timelines, clearly defined outcomes and an operational model including a governance structure, personnel, E-rate reimbursement, support services to LEA's and schools and budget;*
> *(2) Assurances for a fair and open bidding and contracting process;*
> *(3) Technology assessment site survey template;*
> *(4) Documentation of how the technology will be used to enhance teaching in learning;*
> *(5) Documentation of how existing State-invested funds for technology are maximized to implement the school connectivity initiative;*
> *(6) The number, location and schedule of sites to be served in 2007-2008 and in 2008-2009; and*
> *(7) Assurances that local school administrative units will upgrade internal networks in schools, provide technology tools, and support for teachers and students to use technology to improve teaching and learning.*

The NC State Board of Education approved the School Connectivity Initiative *Implementation and Operating Plan* on Thursday, August 2, 2007. The SCI program was managed through the NC ITS Enterprise Project Management Office supervising projects that gained initial EPMO approval in September 2007. Within the *Implementation and Operating Plan* were the following deliverables, all of which were completed in 2009:

- All 115 Local Education Agencies (LEAs) connected to MCNC's North Carolina Research and Education Network (NCREN)
- Establishment of Client Network Engineering Services for LEAs
- Establishment of E-rate Filing Assistance Bureau
- Development of a Technology Master Plan
- Development of Governance and Funding Plans

Each year since the inception of the SCI program, the State Board of Education and the Department of Public Instruction produces a School Connectivity Initiative Report that summarizes the fiscal and functional performance of the program and provides insights into the work of the coming year.

"High-speed broadband connections to schools and advanced Wi-Fi inside classrooms have become essential tools for teachers and students. A major conclusion of the FCC's recent modernization of the E-rate program is that local jurisdictions benefit substantially from state-level assistance in the design, procurement, and ongoing support of this complex communications infrastructure. In our nationwide review of state approaches, we found North Carolina's model to be one of the most effective in the country. State-level support in North Carolina not only with matching financial resources but also purchasing and technical expertise from a dedicated professional staff at the state level has had a major positive impact for schools across North Carolina that stands out as a leading national example."

Jon Wilkins
Chief of the Wireless Telecommunications Bureau
Former Managing Director
Federal Communications Commission

BACKGROUND

The School Connectivity Initiative launched in earnest with the publication of the *Developing Regional Education Networks* report in May 2006. In the ten years since the inception of the SCI program, NC public schools have procured nearly $800,000,000 in network services and infrastructure with State appropriations totaling $184,000,000 leveraged against over $600,000,000 in federal communications commission (FCC) E-rate discount funding. During the ten-year stretch, the telecommunications and computing markets have shifted dramatically, the regulatory environment has been in near constant flux, and the NC legislature has called for and invested in a digital transition in public schools. Perhaps most impressively, NC public schools Internet usage has grown from about 1000 Megabits per second (Mbps) in 2009 to over 98,000 Megabits per second at the writing of this report – with a similar growth forecast for the foreseeable future.
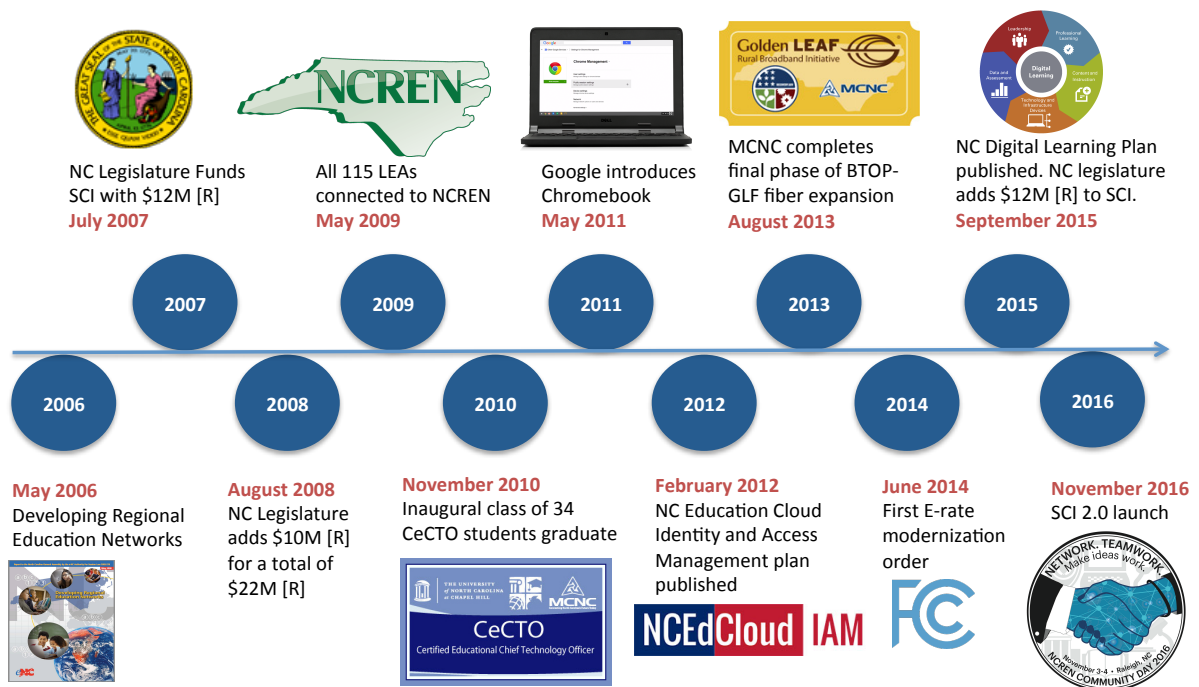
As illustrated by the timeline above, the SCI program has exhibited extraordinary productivity and opportunistic adaptability over its ten-year history. Just a few highlights include: connecting all LEAs to the NC Research and Education Network using an opt-in approach; establishing the Certified Educational Chief Technology Officer (CeCTO) training program; developing, designing and implementing the NCEdCloud identity and access management service; partnering with MCNC and the Golden Leaf Foundation to bring competitive fiber connectivity to rural NC schools and libraries; and, adapting to the NC Digital Learning Plan, the FCC E-rate modernization order, and the growth of 1:1 programs fueled by the release of inexpensive computing devices. While the SCI team has accomplished much in its first decade, there are many opportunities on the horizon. SCI leadership has initiated SCI 2.0 to establish the priorities and framework for school connectivity innovation and support moving forward.

The balance of this report provides a summary of 2016 accomplishments, a financial summary, capacity and usage summary, considerations for 2017, and appendices containing detailed supporting data.

EXECUTIVE SUMMARY

The School Connectivity Initiative (SCI) continues to deliver high quality Internet access, client network engineering, Identity services, E-rate support and funding that benefit all NC public schools. Pursuant to the Appropriations Act of 2015 (S.L. 2015-241), the 2016-17 SCI budget is $31.9M. Major calendar year 2016 SCI accomplishments include:

- Upgraded Internet access to 46 LEAs and 100 charter schools – adding over 40Gbps of aggregate Internet capacity;
- Connected 16 new charter schools to the NC Research and Education Network (NCREN);
- Provided firewall services to 75 LEAs and 95 Charter Schools;
- Provided web security (Internet filtering) services to 79 LEAs and 92 Charter Schools
- Supported 51 LEAs and 40 charter schools with client network engineering (CNE) support services, through 148 total CNE engagements (91 LEA and 57 charter school);
- Continued to focus on high-quality, cost-effective training for public K-12 network administrators in North Carolina. Part of the professional development model is to contract with professional trainers and industry experts for three to five-day intensive training institutes. In 2016 this included a wireless certification course, and as a result, twenty LEA and charter school technology personnel received a highly regarded Certified Wireless Network Administrator (CWNA) certification;
- Managed a wireless infrastructure and services procurement supporting over $55M in purchases for 72 LEAs and 25 charter schools.
- Issuing (in December 2016) a request for proposals soliciting new pricing for Internet access services.

Supporting North Carolina's Digital Learning Plan
Reliable and consistent network access at the classroom and individual device level is imperative to supporting digital-age learning environments in our public schools. In the initial eight years of the SCI, the focus was on high performance and highly available Internet access delivered to the district and to school buildings. The resulting operating and support models for connectivity to the school serve students and educators well. The focus in the most recent two years has shifted to providing similar reliability and performance inside of the school. The SCI team has worked with LEAs and charter schools to upgrade classroom connectivity, targeting summer of 2018 to have all schools and classrooms served with sustainable digital-ready school networks. In 2015 and 2016, NC LEAs and charter schools have invested nearly $98M in internal school infrastructure and services, supported by the SCI program and requiring only $14M in appropriated State funds – with the remaining $84M covered by E-rate ($75M) and USED RttT funds ($9M). The 2016-17 legislative expansion of SCI funding by $12M recurring is imperative to sustaining reliable NC school networks.

Optimizing School Connectivity Efficiency and Return On Investment
While the SCI planning, design, and deployment has focused on upgrading classroom connectivity, we continue to emphasize efficiency and return on investment. Efficiency of operation will always be important for the SCI program as usage continues to grow at a phenomenal pace – and though connectivity service costs continue to drop, the increase in usage and the addition of at least a dozen charter schools per year can easily make for a steeper rise than can be accounted for with cost decreases. Further, through modeling and forecasting we are developing approaches to optimizing E-rate returns and to inform district fiber connectivity build-versus-buy decisions.

The School Connectivity Initiative delivers services to LEAs and charter schools alike that address pressing needs in an ever-changing environment that moves at Internet speed.

"I wish to take a moment to share how important the partnership between Avery County Schools and MCNC is to our students, staff and community. In the summer of 2011, Avery County Schools was able to enter into a district-wide 1:1 instructional project that provided an iPad for every child and staff person in grades K-5 and a MacBook for every student and staff person in grades 6-12. Our Internet utilization immediately went from less than 1000 computers used occasionally throughout the school day to over 2500 devices in use consistently all day long. The connectivity afforded to us by NCREN gives our school community stable, scalable and effective access to content, services and other resources. The funding provided through the NC Connectivity Project that offsets the unfunded E-rate discounted costs of connectivity lets us apply local funds toward other critical needs and helps us work toward our vision of being a national model of education. We are very grateful for the support and service provided by MCNC."

Dennis Brown
Chief Technology Officer
Avery County Schools

"This <wireless certification> class was absolutely incredible. It's probably the best class I've ever gone through where I learned so much daily that directly impacts my day-to-day job role and scope at work. The instructor was incredible. I really appreciate him teaching it from the perspective of teaching us a technology first, learning something, then the test second. Even with that style he prepared us so well for the test so it's a win-win. I just can't say enough good things about this experience."

Jeremy Fisher
Network Administrator
Harnett County Schools

"My work with the CNE team began in Spring 2015 with a request for a network assessment. Based on the findings in the report, we drew up plans for a new network, priced out various platforms from different vendors, and leveraged E-rate 2.0 monies for the eventual purchase. Our work culminated in Summer 2016 with the installation and configuration of the new network, which the CNE team helped with, going so far as to help physically mount switches and run cabling in the network closets. Over those 15 or so months, the CNE team consistently provided a high level of service, and the resulting product is of very high quality."

Evan Menchini
Technology Director
Voyager Academy

PERFORMANCE OVERVIEW

Financial Summary

For 2016 the School Connectivity Initiative is a $125M program supported with legislative funding of $31.9M leveraged against FCC E-rate program reimbursements in excess of $93M. The table below summarizes SCI costs and related State funding and FCC E-rate reimbursements.

	Total Cost	E-rate Share	State Share
Category 1 School Fiber Connections	$43.2M	$34.0M	$9.2M
Category 1 Consortium Internet - LEAs	$17.7M	$14.2M	$3.5M
Category 1 Consortium Internet - charters	$3.3M	$2.1M	$1.2M
Category 2 Classroom Connections	$57.5M	$43.3M	$14.2M
E-rate Eligible Totals	**$121.7M**	**$93.6M**	**$28.1M**
Identity and Access Management	$1.5M	-	$1.5M
Client Network Engineering	$1.6M	-	$1.6M
Program Administration – NCDPI and FI	$0.7M	-	$0.7M
Non E-rate Eligible Totals	**$3.8M**	**-**	**$3.8M**
Grand Totals	**$125.5M**	**$93.6M**	**$31.9M**

Most SCI expenses are eligible for FCC E-rate discounts. E-rate eligible expenses are grouped into Category 1 and Category 2. Category 1 expenses include high-speed fiber optic[1] connections to schools and districts and Internet bandwidth charges. Category 2 expenses include wireless and wired infrastructure and services deployed inside schools to connect classrooms to the Internet. For 2016, the total cost of E-rate eligible expenses is in excess of $121M with E-rate discounts of over $93M leaving a State share of $28.1M. The $3.8M balance of SCI expenses comprises non-E-rate eligible services including identity and access management, client network engineering support, and program administration. Specifically, SCI program expenses include the following.

1. <u>Category 1 School Fiber Connections</u> – Most LEAs contract with private providers to connect their schools into a district network via high-speed fiber optic connections[2]. Private providers include Time Warner Cable, AT&T, CenturyLink, Broadplex, Conterra, and others. These school connections are eligible for FCC E-rate discounts of up to 90%. The SCI provides support and training in acquiring school connections and provides funding allotments to cover the non-discount share of costs to all NC LEAs. NCDPI calculates allocations based on actual contracts and invoices and delivers funding via PRC 073. Since the inception of the SCI, funding totals

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[1] Over 99% the 2694 schools in North Carolina are connected via fiber optic connection – the remaining 22 schools are connected via a high speed wireless solution, with 9 of those slated to transition to fiber in the coming year.

[2] A dozen NC LEAs connect schools via fiber that is owned and managed by either the school system or a community collaborative. SCI provides funding allotments to these districts based on actual maintenance costs.

have remained in the $9M to $10M range – even with substantial upgrades to school bandwidth and services each year.

2. Category 1 Consortium School Internet – Core to the SCI is that all NC LEAs and charter schools have access to reliable high-speed Internet access via the NC Research and Education Network (NCREN) managed by MCNC – the same network that provides Internet access to the UNC system universities, NC community colleges, most NC private colleges and universities, and all of State government. Internet connections are monitored and upgraded on demand as usage exceeds 60% of available capacity. Charter schools have the option of either receiving a per ADM allotment via PRC 036[3] or receiving State-funded Internet access.

3. Category 2 Classroom Connections – In Spring of 2016, NC LEAs and charter schools procured over $57M in classroom connectivity infrastructure and services; over $55M of those procurements used contracts established by NCDPI in 2015. The SCI provides support and training in acquiring internal school infrastructure and provides funding allotments to cover the non-discount share of costs to participating LEAs and charter schools. NCDPI calculates allocations based on actual contracts and invoices and delivers funding via PRC 073 to LEAs and PRC 036 to charter schools.

4. Identity and Access Management – The 2015 appropriations act expanded the SCI budget by $12M annually effective FY2016-17. Identity and access management (IAM) services are included in the expansion budget. *NCEdCloud IAM* services provide for a single user ID and password for students, faculty and staff to access network accessible content. IAM services automate the provisioning and management of nearly 2.5 million user accounts and the integration of those accounts with cloud-based applications and services. NCDPI manages the NCEdCloud IAM service, including a $1.5M per year contract with an identity services provider.

5. Client Network Engineering (CNE) – MCNC provides CNE services under contract to NCDPI. LEAs and charter schools engage MCNC for high-level troubleshooting, network design consultation, and related training services. NCDPI also engages MCNC directly through the CNE contract to provide specific network and Cloud services management functions for LEAs and charter schools. MCNC bills quarterly for actual hours serving districts and charter schools. The CNE contract allows for up to $1.6M in billings for the 2016 fiscal year.

6. Program Administration – SCI program administration includes NCDPI school connectivity staff, Friday institute contract support, and related travel supplies and materials costs. Six NCDPI staff members provide technical consulting, E-rate training, and related SCI support at a combined salary expense of $409,000[4]. A Friday Institute contract provides for planning, design, forecasting, modeling, and documentation support at an annual cost of $215,000. It is notable that administrative costs associated with managing the SCI account for less than 2.5% of the $31.9M State appropriation and 0.6% of the $125M total annual cost of services.

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[3] PRC 036 allotments are calculated based on the per ADM sum of CAT1 fiber connections and consortium Internet in the host county/LEA.

[4] SCI provisional language allows for up to 8 FTE and $1M. See Appendix C – Connectivity Staff Salary Report for details.

The SCI program has substantial funding, budgeting, procurement and oversight elements that are imperative to the delivery of reliable connectivity to public schools. It is through the Client Network Engineering and E-rate services that many LEA and charter school staff interact with the SCI program.

"As the new CTO in Chapel Hill-Carrboro City Schools, getting a third-party assessment of our district's network health was a fundamental need in being able to guarantee the digital services that are indispensable to teaching and learning today. I knew from previous experience that comprehensive third-party assessments can be prohibitively expensive. I learned about the offerings of MCNC and how they could help. MCNC was incredibly quick to respond for an informal meeting to discuss our needs and in establishing a timeline for our network assessment. The assessment we received was incredibly detailed, and is being supported by the engineer who completed the assessment, as he is able to come back and help us develop a project plan to realize the report's recommendations. To have access to this level of expertise is critical in helping us ensure we provide a safe and secure network for our staff, students, and parents."

Daniel Curry-Corcoran, PhD
Chief Technology Officer
Chapel Hill-Carrboro City Schools

"Lake Norman Charter launched a full 1:1 technology initiative (1:World) in the 2014-2015 school year that has positively and significantly changed how our students synthesize, collaborate and creatively in present their work. Simply put, would not have been possible without MCNC's support and Internet connection. As we prepared to move forward with the program, MCNC provided frequent consultation and when needed, an on-site engineer to help us to prepare our infrastructure. They have also continued to help monitor our usage needs and provided more capacity as the students & staff expanded their usage. We are grateful to have had MCNC's support to help us to make this transformational shift at LNC!"

Shannon Stein
Superintendent
Lake Norman Charter School

"Jeannene Hurley <Lead E-rate Analyst, NCDPI> provides an invaluable service to the LEAs across North Carolina, training, assisting and generally informing districts on navigating the E-Rate program for schools and libraries. At Watauga County Schools, we have relied heavily on her training and guidance in order to comply with the many aspects of E-Rate filing, which is so critical to the success of the technology in our schools. The importance of the commitment that North Carolina has made to the E-Rate consultants supporting our districts and ultimately our students cannot be overstated."

Nancy Zeiss
Director of Technology Services
Watauga County Schools

Capacity and Usage Summary

Internet usage continues to grow as districts add more devices, allow students to bring their own devices, and employ more online resources for instruction. MCNC bills the State for Internet Bandwidth each month based on a contracted bandwidth level for each district and charter school. There are ten bandwidth levels ranging from 100 Mbps to 15,000 Mbps (i.e., 15 Gbps). As LEAs and charter schools exceed 60% usage measured against the bandwidth service level, the SCI team initiates upgrades to the next highest service level.
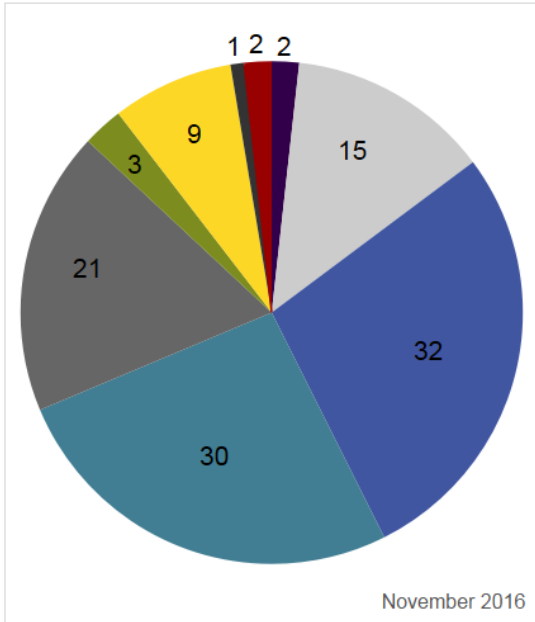

The chart above illustrates the CY2016 month-over-month growth in contracted Internet bandwidth. The monitoring and upgrade process ensures that schools have access to enough Internet capacity to support growth in devices and applications while at the same time protecting against expending funds for over-provisioning. Aggregate contracted bandwidth grew from 140 Gbps in December 2014 to over 171 Gbps in November of 2015. Each bar shows the bandwidth contribution in each of the ten service tiers. The SCI team regularly works with the service provider community to add new service tier options to accommodate growth as efficiently as possible. To that end, a 15 Gbps tier was added in December 2015 for Wake County Schools and Charlotte-Mecklenburg Schools, both of whom transitioned from then current 10,000 Mbps services. The SCI team manages the scheduling of upgrades to avoid adding new services and expense during the summer months. As illustrated in the chart below, only two LEAs remain at the lowest 100 Mbps service tier, while 66 LEAs enjoy at least 1000 Mbps (1 Gbps) of Internet capacity – with those 66 LEAs representing nearly ninety percent of the students.

Contracted Bandwidth (Mbps)
(Count of School Districts)

(Estimated Number of Students)

Bandwidth
to
School
Districts
(Mbps)
- 100
- 250
- 500
- 1000
- 2000
- 3000
- 4000
- 5000
- 15000

November 2016
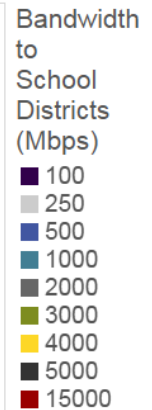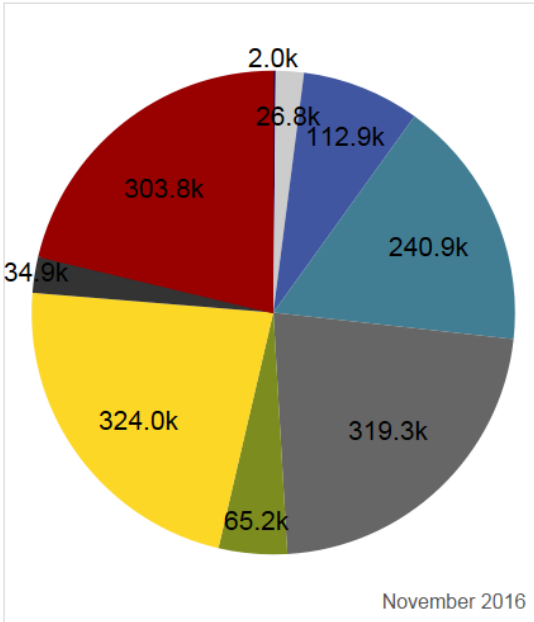
Aggregate bandwidth usage continued the trend of phenomenal year-over-year growth in calendar year 2016. All told, K12 is the largest single user of MCNC's NCREN backbone, ***contributing <u>double</u> the traffic of the UNC system, the independent colleges and universities, and the community college system, combined.*** MCNC's network continues to perform exceedingly well – maintaining high availability and low delay. Furthermore, MCNC peering, commodity offload, and caching solutions keep content close to the users and keep costs in check – even as usage doubles year over year.

Statewide Contracted Bandwidth, Peak and Average Daily Use - School Districts

- Contracted Bandwidth
- Peak Daily Utilization
- Average Daily Utilization

13
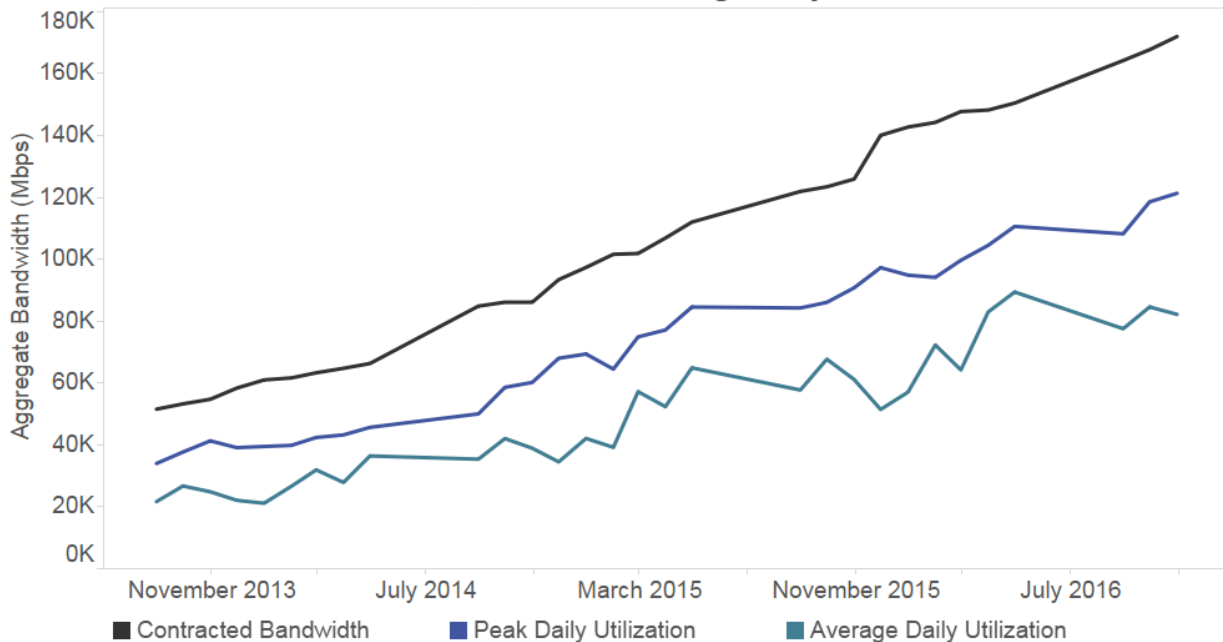
The graph above plots contracted bandwidth against peak daily 95th percentile utilization and per student utilization over the most recent three years. Peak daily 95th percentile utilization represents the aggregate peak day for each month while per student utilization represents the monthly average across all districts. Tracking both peak and average informs decisions related to defining *enough* bandwidth and *enough* headroom. Peak daily 95th percentile utilization for November 2016 is 121 Gbps while per student utilization is 82 Gbps. A year ago peak was 91 Gbps and average per student utilization was 61 Gbps.

Internal Connections Summary

Session Law 2015-241 expanded SCI funding to support the sustainability of internal school connections – adding $2M in 2015-16 and $12M recurring in 2016-17. During 2015, the SCI team established a dozen contracts for wireless and wired network equipment and related services. In 2016 LEAs wrote purchase orders against these SCI contracts totaling over $55M. The table below summarizes 2016 E-rate category 2 internal connections procurements by discount percentage. Most NC LEAs receive 80% discounts on E-rate eligible internal connections products and services – accounting for $35M of the $55.6M in 2016 procurements. NC public schools requested $41.8M in E-rate funding for an aggregate discount rate of 75%.

E-Rate Discount %	Total Contract Cost	E-Rate Funding Request	Number of LEAs	% of Total E-Rate Commitments	% of LEAs
85	$4,501,558	$3,826,324	24	9.2%	24%
80	$35,750,928	$28,600,742	42	68.5%	43%
70	$2,479,172	$1,735,420	4	4.2%	4%
60	$12,111,815	$7,267,089	13	17.4%	13%
50	$384,802	$192,401	6	0.5%	6%
40	$389,645	$155,858	8	0.4%	8%
20	$20,160	$4,032	1	0.0%	1%
Total	**$55,638,080**	**$41,781,867**	98		

With an investment of over $42M in 2015 and $55M in 2016, the SCI program has made substantial progress in the provision of digital-ready classrooms in NC public schools. According to the 2016 Digital Learning and Media Inventory (DLMI) data, 70% of NC schools report at least one wireless access point per classroom – one indicator of digital readiness. At the current upgrade and installation pace, the target is to have all NC schools at the one access point per classroom standard by June 30, 2018. It is notable that more than 72% of charter schools responding to the DLMI survey report less than one access point per classroom. Due to variations in charter school facilities and class size, as compared to traditional public school counterparts, access point counts are a less reliable indicator of digital learning readiness. Moreover, tracking investments in infrastructure and services provides a limited view of readiness related to classroom access. There are many operational elements of internal school level infrastructure and services that are not easily measured in a comprehensive manner. It will be important to understand these operational considerations in order to have a more accurate picture of actual digital readiness.

Access points per Classroom

Districts

5
0.2%

533
21.9%

730
30.0%

1,168
47.9%

Charters

6
7.8%

4
5.2%

11
14.3%

56
72.7%
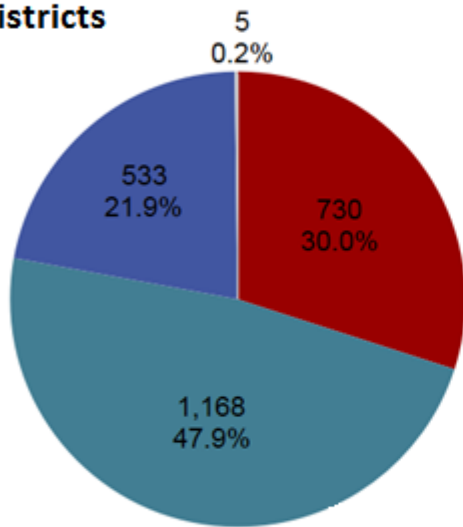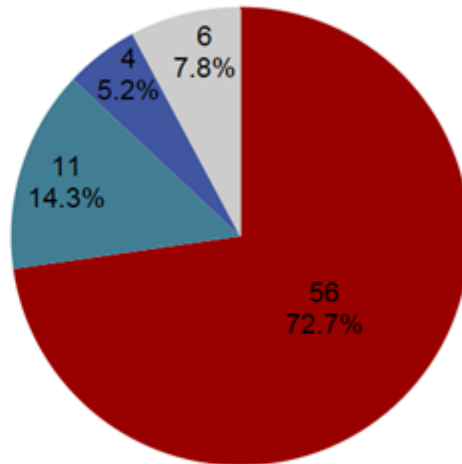
Categories

- <1 per classroom
- 1 per classroom
- >1 per classroom
- Null

CONSIDERATIONS FOR 2017

Classroom connectivity performance monitoring
Explore the use of network sensors and applications that can be used by school and district technology staff and teachers in the classroom to measure school Wi-Fi performance at specific times, such as before standardized tests or when streaming video performance is poor.

Efficiency in procurement of school fiber connections
Investigate regional convenience contracts for external school connectivity services that include dark fiber options to increase competition. Consider making PRC funding tied to efficiency, similarly to how transportation is funded.

Firewall and web security funding
Increase funding for web filtering, firewall services and other security and privacy measures that may be deemed prudent in order to mitigate network risks. Some of these services were previously federally funded, but they are no longer eligible for E-rate funding after the changes made to the program in 2015.

Procurement Policy
Investigate procurement provision that allows DPI to establish contracts for LEAs to include libraries and any other State entity that is eligible for E-rate. Modify that statute (SL 2013-360 Section 7.6) so that the contracts bid from the University (or specifically NCSU) can be used by an LEA or library.

SCI 2.0
With the expansion of the SCI budget and scope, coupled with changes in the marketplace and in E-rate rules, the SCI team will be reshaping the SCI program during calendar year 2017. The reshaping will include:

- Establishing school fiber build and wide area network procurement guidelines;
- Establishing fair and efficient allotment strategies for internal connection funding;
- Developing a strategy for addressing the growing issue of Charter School bandwidth costing disproportionately higher per student as compared to LEAs;
- Developing strategies for more granular monitoring – including content and application usage statistics;

SUPPORTING DOCUMENTATION

LEA and charter school connectivity allocation data can be found at the link below.
http://www.dpi.state.nc.us/connectivity/links/funding/

NC Digital Learning Plan documents including the 2015 Detailed and Summary reports, the wireless infrastructure survey, and wireless infrastructure RFP can be found at the links below.
http://ncdlplan.fi.ncsu.edu/findings-and-recommendations/technology-infrastructure-and-devices/
http://ncdlplan.fi.ncsu.edu/category/publications/

An interactive map that illustrates LEA and charter school aggregate and per student network utilization statistics can be found at the link below.
https://www.mcnc.org/ncren/portal/reporting/ncren_utilization_map

A data dashboard presenting connectivity usage data and related statistics can be found at the link below.
http://friday.institute/scireport

The balance of this report includes supporting data as follows.

APPENDIX	DATA
A	2016 PRC 073 Category 1 school connection allotments by LEA
B	2016 PRC 160 Category 2 school infrastructure allotments by LEA and charter school
C	2016 PRC 036 allotments by Charter School
D	The NCDPI connectivity staff salary report
E	North Carolina E-rate funding history report

APPENDIX A - 2016 LEA PRC 073 ALLOTMENTS

These are the allotments for the E-rate Category 1 LEA school connections. Specifically, LEAs requested E-rate funds during spring of 2015 with service funding year between July 1, 2015 and June 30, 2016. PRC 073 allotments distributed during calendar year 2016 to cover non-E-rate costs for eligible school connections. In total $8,568,457 was allotted and leveraged against $43,986,249 in committed E-rate funding.

LEA	LEA Name	PRC 073
10	Alamance-Burlington	$85,032
20	Alexander County	$29,707
30	Alleghany County	$30,370
40	Anson County	$22,332
50	Ashe County	$36,960
761	Asheboro City	$22,243
111	Asheville City	$52,075
60	Avery County	$19,819
70	Beaufort County	$39,943
80	Bertie County	$25,024
90	Bladen County	$50,667
100	Brunswick County	$78,201
110	Buncombe County	$119,907
120	Burke County	$85,224
130	Cabarrus County	$230,597
140	Caldwell County	$88,375
150	Camden County	$21,725
160	Carteret County	$121,344
170	Caswell County	$11,905
180	Catawba County	$100,224
681	Chapel Hill-Carrboro	$43,308
190	Chatham County	$50,453
200	Cherokee County	$26,827
210	Chowan County	$31,351
220	Clay County	$10,800
230	Cleveland County	$76,080
821	Clinton City	$24,000
240	Columbus County	$62,891
250	Craven County	$53,539
260	Cumberland County	$265,941
270	Currituck County	$46,379

280	Dare County	$50,314
290	Davidson County	$147,617
300	Davie County	$68,607
310	Duplin County	$38,442
320	Durham Public	$143,916
330	Edgecombe County	$18,618
861	Elkin City	$7,000
340	Forsyth County	$231,360
350	Franklin County	$76,080
360	Gaston County	$156,216
370	Gates County	$16,042
380	Graham County	$3,000
390	Granville County	$54,715
400	Greene County	$21,034
410	Guilford County	$372,960
420	Halifax County	$52,150
430	Harnett County	$183,291
440	Haywood County	$75,816
450	Henderson County	$78,003
460	Hertford County	$12,570
181	Hickory City	$50,965
470	Hoke County	$54,878
480	Hyde County	$4,169
490	Iredell County	$482,266
500	Jackson County	$17,700
510	Johnston County	$111,960
520	Jones County	$11,977
132	Kannapolis City	$22,618
530	Lee County	$63,118
540	Lenoir County	$43,210
291	Lexington City	$12,355
550	Lincoln County	$70,941
560	Macon County	$64,500
570	Madison County	$8,880
580	Martin County	$35,053
590	McDowell County	$42,828
600	Mecklenburg County	$324,384
610	Mitchell County	$17,429
620	Montgomery County	$16,908

630	Moore County	$89,712
491	Mooresville City	$11,176
862	Mount Airy City	$20,929
640	Nash-Rocky Mount	$18,919
650	New Hanover County	$175,190
182	Newton-Conover	$7,312
660	Northampton County	$9,951
670	Onslow County	$275,588
680	Orange County	$70,656
690	Pamlico County	$10,000
700	Pasquotank County	$48,791
710	Pender County	$75,804
720	Perquimans County	$21,040
730	Person County	$37,469
740	Pitt County	$172,440
750	Polk County	$10,639
760	Randolph County	$106,845
770	Richmond County	$33,992
421	Roanoke Rapids City	$25,486
780	Robeson County	$64,200
790	Rockingham County	$125,236
800	Rowan-Salisbury	$150,406
810	Rutherford County	$14,185
820	Sampson County	$29,400
830	Scotland County	$36,825
840	Stanly County	$91,446
850	Stokes County	$94,204
860	Surry County	$41,805
870	Swain County	$15,000
292	Thomasville City	$11,635
880	Transylvania County	$18,336
890	Tyrrell County	$3,000
900	Union County	$427,315
910	Vance County	$47,698
920	Wake County	$578,280
930	Warren County	$28,810
940	Washington County	$15,160
950	Watauga County	$65,160
960	Wayne County	$106,981

422	Weldon City	$8,682
241	Whiteville City	$5,000
970	Wilkes County	$22,380
980	Wilson County	$59,064
990	Yadkin County	$44,945
995	Yancey County	$14,232
	Total	**$8,568,457**

APPENDIX B – 2016 PRC 160 ALLOTMENTS

These are the allotments for the E-rate Category 2 infrastructure procurements. Specifically, LEAs and charter schools requested E-rate funds during spring of 2015, purchased equipment and services using NCDPI-managed contracts, and received PRC 160 allotments for costs not covered by E-rate during 2016. In total, $9,192,844 was allotted and leveraged against $35,493,334 in E-rate funds. **All PRC 160 distributions were paid using Federal Race to the Top (RttT) grant funds.**

LEA Number	LEA/Charter Name	PRC 160
10	ALAMANCE-BURLINGTON SCH DIST	$343,327
20	ALEXANDER COUNTY SCHOOL DIST	$135,621
69A	ARAPAHOE CHARTER SCHOOL	$18,098
50	ASHE COUNTY SCHOOL DISTRICT	$70,577
761	ASHEBORO CITY SCHOOLS DISTRICT	$62,803
111	ASHEVILLE CITY SCHOOL DISTRICT	$47,368
70	BEAUFORT COUNTY SCHOOL DIST	$145,926
80	BERTIE COUNTY SCHOOL DISTRICT	$20,953
90	BLADEN COUNTY SCHOOL DISTRICT	$123,557
180	CATAWBA COUNTY SCHOOL DISTRICT	$301,619
200	CHEROKEE COUNTY SCHOOL DIST	$67,252
230	CLEVELAND COUNTY SCHOOL DIST	$103,344
821	CLINTON CITY SCHOOL DISTRICT	$186,245
240	COLUMBUS COUNTY SCHOOL DIST	$294,522
270	CURRITUCK COUNTY SCHOOL DIST	$193,877
290	DAVIDSON COUNTY SCHOOL DIST	$167,086
300	DAVIE COUNTY SCHOOL DISTRICT	$41,956
310	DUPLIN COUNTY SCHOOL DISTRICT	$127,892
700	ELIZABETH CITY-PASQUOTANK PUBLIC SCHOOLS	$208,544
861	ELKIN CITY SCHOOL DISTRICT	$41,514
360	GASTON COUNTY SCHOOL DISTRICT	$16,500
370	GATES COUNTY SCHOOL DISTRICT	$43,151
380	GRAHAM COUNTY SCHOOL DISTRICT	$37,095
390	GRANVILLE COUNTY SCHOOL DIST	$166,913
400	GREENE COUNTY SCHOOL DISTRICT	$17,254
440	HAYWOOD COUNTY SCHOOL DISTRICT	$94,970
91B	Henderson Collegiate	$10,090
450	HENDERSON COUNTY PUB SCH DIST	$380,390
181	HICKORY CITY SCHOOL DISTRICT	$73,137
470	HOKE COUNTY SCHOOL DISTRICT	$224,015
480	HYDE COUNTY SCHOOL DISTRICT	$89,820
500	JACKSON COUNTY SCHOOL DISTRICT	$97,661

520	JONES COUNTY SCHOOL DISTRICT	$16,509
132	KANNAPOLIS CITY SCHOOL DIST	$88,728
530	LEE COUNTY SCHOOLS	$8,342
540	LENOIR COUNTY PUBLIC SCHOOLS	$20,597
291	LEXINGTON CITY SCHOOL DISTRICT	$41,984
560	MACON COUNTY SCHOOL DISTRICT	$119,006
570	MADISON COUNTY SCHOOL DISTRICT	$61,216
590	MCDOWELL COUNTY SCHOOL DIST	$27,997
620	MONTGOMERY COUNTY SCHOOL DIST	$37,299
862	MOUNT AIRY CITY SCHOOL DIST	$31,689
640	NASH-ROCKY MOUNT SCHOOL DIST	$201,207
182	NEWTON-CONOVER CITY SCH DIST	$118,959
660	NORTHAMPTON COUNTY SCHOOL DIST	$37,296
720	PERQUIMANS COUNTY SCHOOL DIST	$93,014
740	PITT COUNTY SCHOOL DISTRICT	$453,545
760	RANDOLPH COUNTY SCHOOL DIST	$521,800
770	RICHMOND COUNTY SCHOOL DIST	$128,463
780	ROBESON COUNTY PUBLIC SCHOOLS	$139,597
790	ROCKINGHAM COUNTY SCHOOLS	$366,833
810	RUTHERFORD CO SCHOOL DISTRICT	$210,128
820	SAMPSON COUNTY SCHOOL DISTRICT	$68,102
850	STOKES COUNTY SCHOOL DISTRICT	$51,440
292	THOMASVILLE CITY SCHOOL DIST	$44,606
880	TRANSYLVANIA CO SCH DISTRICT	$66,279
890	TYRRELL COUNTY SCHOOL DISTRICT	$126,457
910	VANCE COUNTY SCHOOL DISTRICT	$273,602
970	WILKES COUNTY SCHOOL DISTRICT	$154,306
980	WILSON COUNTY SCHOOL DISTRICT	$275,551
340	WINSTON-SALEM/FORSYTH CO S D	$1,272,483
990	YADKIN COUNTY SCHOOL DISTRICT	$132,023
995	YANCEY COUNTY SCHOOL DISTRICT	$50,709
	Total PRC 160 Allotments	**$9,192,844**

APPENDIX C – 2016 CHARTER PRC 036 ALLOTMENTS

Charter schools may choose to receive a centrally funded Internet connection or a PRC 036 allotment that is calculated based on the SCI per ADM benefit to their home LEA. These are the 2016 PRC 036 allotments for participating charter schools.

Charter Name	PRC 036
Academy of Moore	$5,000
A.C.E. Academy	$5,000
Anderson Creek Club Charter School	$6,000
Arts Based School	$5,000
Bethany Community Middle	$5,000
Brevard Academy	$14,000
Cabarrus Charter Academy	$5,000
Cardinal Charter	$5,000
Carter Community	$6,000
Charlotte Lab	$5,000
CIS Academy	$5,000
Clover Garden	$5,000
Crosscreek Charter	$6,000
Dillard Academy	$5,000
Dynamic Community Charter	$5,000
East Wake Academy	$5,000
Entrepreneur High School	$5,000
Envision Science Academy	$5,000
Evergreen Community Charter	$5,000
Excelsior Classical	$5,000
Exploris School	$5,000
Falls Lake Academy	$10,000
Flemington Academy	$6,000
Forsyth Academy	$5,000
Gaston College Preparatory	$6,000
Grandfather Academy	$12,000
Gray Stone Day School	$6,000
Greensboro Academy	$5,000
Healthy Start Academy Charter	$6,000
Henderson Collegiate	$5,000
Hope Charter Leadership Academy (Formerly Hope Elementary)	$5,000
Ignite	$5,000
Invest Collegiate Transform	$5,000
Island Montessori	$5,000
Kennedy School	$5,000
KIPP Halifax College Preparatory	$6,000
KIPP: Charlotte	$5,000
KIPP: Durham Preparatory	$5,000
Langtree Charter Academy	$5,000

Learning Center	$17,000
Longleaf School of the Arts	$5,000
Maureen Joy Charter	$6,000
Millennium Charter Academy	$6,000
PACE Academy	$5,000
Paul R. Brown Leadership Academy	$6,000
PAVE SE Raleigh	$5,000
Phoenix Academy	$5,000
Pinnacle Classical Academy	$5,000
Pioneer Springs Community School	$5,000
PreEminent Charter	$5,000
Queen's Grant Community	$5,000
Quest Academy	$5,000
Reaching All Minds Academy	$6,000
Research Triangle Charter Academy	$6,000
Sallie B. Howard	$6,000
Sandhills Theatre Arts Renaissance School (STARS)	$6,000
Shining Rock Classical	$5,000
South Brunswick Charter School	$5,000
STEM Education for a Global Society Academy (SEGS)	$5,000
Summerfield Charter Academy	$5,000
Summit Charter	$20,000
The Academy of Moore County	$5,000
The Capitol Encore Academy	$5,000
The Carter G. Woodson School of Challenge	$5,000
The Central Park School for Children	$5,000
The Children's Village Academy	$5,000
The College Preparatory and Leadership Academy of High Point	$5,000
The Community Charter	$5,000
The Expedition School	$5,000
The Franklin Academy	$5,000
The Franklin School of Innovation	$5,000
The Hawbridge School	$5,000
The Institute for the Development of Young Leaders (IDYL)	$5,000
The Mountain Community	$5,000
The New Dimensions	$5,000
The North Carolina Leadership Academy	$5,000
Tiller School	$5,000
Vance Charter	$5,000
VERITAS Community	$5,000
Wake Forest Charter Academy	$5,000
Wilmington Preparatory Academy	$5,000
Winterville Charter Academy	$5,000
Youngsville Academy	$5,000
Total PRC 036	**$478,000**

APPENDIX D - CONNECTIVITY STAFF SALARY REPORT

The following are NCDPI staff paid from School Connectivity Initiative funding and their respective salaries.

Title of Position and Description of Duties	Salary
Lead Connectivity and E-Rate Analyst: provides LEA/Charter School Technical Consulting, Strategic Planning, Project Management	$87,943
Lead E-Rate Analyst: provides LEA/Charter School Technical Consulting, Strategic Planning	$76,506
E-Rate Program Administrator: provides E-rate Education and Consultation Services	$72,726
E-Rate Program Administrator: provides E-rate Education and Consultation Services	$64,265
Education Consultant II: Assists with Digital Teaching and Learning Integration	$67,420
Technology Support Center Analyst: Provides help desk support for SCI related calls	$40,662
Total	$409,522

APPENDIX E – NORTH CAROLINA E-RATE FUNDING HISTORY REPORT

The following report run in October 2016 shows North Carolina public school E-rate funding requests, the total pre-discount amount for all requested services, the amount of E-rate funding being requested, the amount of funding ultimately committed by the FCC, the amount of funding disbursed, and the utilization of funds (disbursed/committed). Note that there are still disbursements outstanding for 2015 – including over $10M for consortium Internet. For 2016, the vast majority of requests have not yet been approved though the expectation is that on the order of 97% of what is requested will be committed.

Year	Requests	Pre-Discount	Requested	Committed	Disbursed	Utilization %
2016	1,362	$143,294,447	$101,618,087	$28,636,167	$1,710,870	6%
2015	1,799	$148,550,545	$112,782,073	**$108,436,609**	$83,720,376	77%
2014	1,149	$130,282,860	$103,576,765	$68,505,830	$60,452,021	88%
2013	1,090	$128,061,575	$102,983,843	$67,257,466	$60,403,671	90%
2012	1,141	$140,959,571	$112,784,516	$80,088,802	$71,461,732	89%
2011	1,282	$128,875,656	$103,233,329	$71,388,019	$63,843,598	89%
2010	1,262	$109,507,564	$85,942,335	$78,504,887	$66,345,445	85%
2009	1,165	$98,312,963	$75,294,273	$61,405,999	$52,103,213	85%
2008	1,258	$91,746,583	$70,282,085	$57,091,132	$50,501,836	88%
2007	1,733	$100,873,061	$77,535,432	$58,250,860	$49,861,383	86%
2006	1,403	$110,262,568	$85,353,133	$47,406,255	$40,360,361	85%
2005	2,355	$96,196,207	$72,049,708	$51,008,937	$43,963,129	86%
2004	2,292	$78,661,600	$57,973,923	$37,480,433	$30,336,639	81%
2003	2,076	$97,322,227	$75,814,000	$45,339,691	$37,042,927	82%
2002	1,946	$79,663,215	$62,291,488	$47,968,216	$39,497,438	82%
2001	2,223	$61,576,928	$44,222,112	$20,166,017	$16,038,416	80%
2000	2,217	$60,099,851	$41,708,939	$20,915,884	$17,740,889	85%
1999	1,845	$48,447,701	$33,670,538	$28,605,610	$24,649,511	86%
1998	3,041	$44,388,023	$28,969,621	$21,511,196	$17,384,524	81%
	32,639	$1,897,083,144	$1,448,086,200	**$999,968,009**	$827,417,980	