Department of Information Technology

History

- 1957/1958: In about 1957, the County of Henrico’s Finance Department created a Tabulating Section which later became the Department of Information Technology.
- 1958/1959: In January 1958, the first payroll and tax billing operations were processed on 8 pieces of leased tabulation equipment. The tabulation equipment was punched card unit record equipment.
- 1959/1960: During 1960, the first utility billing was processed. About 20,000 utility bills and about 170,000 tax bills were processed.
- 1960/1961: 1960 was the first year the term computer was referenced in annual reports in addition to the tabulating equipment. The school census was added to the list applications processed by the Tabulating Section. The computer was a Univac computer but the model is not known.
- 1961/1962: The Tabulating Section was described in an annual report as providing “data processing” and “machine records” services.
- 1962/1963: By 1963, the Tabulating Section was considered a model for other localities when they wished to modernize their procedures. State poll tax payments were added to the list of applications. More than 23,000 water bills per month and more than 185,000 tax bills per year were processed and printed.
- 1963/1964: In 1964, the Tabulating Section added a Univac 1004 to their computing equipment. The 1004 was the first computer that allowed the County to embrace what was then known as internal computing. A 1004 requires a “plug panel” wiring board like punched card unit record equipment but it also had 1,004 positions of internal memory that could be used to speed up the calculation process. More than 27,000 utility bills per month and more than 200,000 tax bills per year were processed and printed.
- 1965/1966: The Tabulating Section was renamed to the Data Processing Section. More than 30,000 utility bills per month and more than 200,000 tax bills per year were processed and printed.
- 1966/1967: During 1967, the Data Processing Section started a migration from using punched cards as their primary storage to a new Sperry Univac 9300 mainframe computer with tape as the primary storage. The 9300 was the County’s introduction into mainframe computing. The 9300 no longer used “plug panel” wiring boards for programming. All programs used internal computing. The primary programming language had been Report Program Generator (RPG) but with the introduction of the 9300 Data Processing started using the COmmon Business-Oriented Language (COBOL) which went on to become the de facto standard language for most businesses in America for many years. More than 33,000 utility bills per month and more than 210,000 tax bills per year were processed and printed.
• 1968/1969: New applications and budget reporting came to the County using the new 9300 mainframe computer acquired in 1967. More than 34,000 utility bills per month and more than 250,000 tax bills per year were processed and printed.

• 1970/1971: The Data Processing section of Finance became a separate department known as the Division of Data Processing, or DP for short. The first Director appointed was Kenneth R. Peters who was a retired Lieutenant Colonel from the Air Force. He was known as Colonel Peters. He came to Henrico in the fall of 1969. Three new, internally developed, applications went into production during this same period. These were the Uniform Payroll, Leave Accrual and Personnel System, the Financial Management System including a Monthly Appropriations, Accounts Payable, and Cost Accounting sub-systems, and finally a Henrico School System including Pupil Scheduling, Pupil Grading, Pupil Accounting and Reporting sub-systems supporting 40 schools. A new Utility Connection Fee System developed by a consultant firm also went live during this period. More than 43,000 utility bills per month and more than 280,000 tax bills per year were processed and printed.

• 1971/1972: Data Processing upgraded to a Sperry Univac 9400 to keep up with the work load. The 9300 had 16k (16,384 positions) of memory. The new 9400 had 64k (65,536 positions) of memory and could run up to five programs concurrently. The 9300 could only run one program at a time. The 9400 introduced disk storage for the first time into the County’s computing environment. The number of production run hours increased from 150 hours per month to approximately 350 hours per month. During this same period Data Processing became a “24x5” operation. This eventually grew into a “24x7” operation. A new Library System was also added and development of new Welfare and Voter Registration Systems were begun.

• 1972/1973: DP had a staff compliment of twenty-seven at the close of 1973. Henrico was the first local government in Virginia to convert to the Virginia Uniform Welfare Reporting System (VUWRS). This system was developed in collaboration among several local governments including Henrico.

• 1973/1974: The Sperry Univac 9400 was upgraded to a 9480 to allow the internal memory to be increased to 256k (262,144 positions) of memory. (30 employees)

• 1974/1975: Three remote terminals were added starting the first communications network. (32 employees)

• 1975/1976: DP saw the introduction of several additional computer terminals to allow more remote access to the mainframe computer. DP also saw a change in the guard with the retirement of Colonel Peters. Kendall Burroughs was appointed to be the new Director of the Division of Data Processing. His stay with the County was less than one year.

• 1976/1977: DP saw another change of the guard with the appointment of Brian D. Wantling in January 1977 as the new Director of the Division of Data Processing. DP moved to the new Government Center on Parham Road during October of 1977. The 9480 mainframe computer was also moved to the new facility.

• 1978/1979: A new mainframe computer was leased and installed. It was known as a Sperry Univac Series 90 90/40. A conversion from the 9480 to the 90/40 was completed in 1978. The 90/40 had 1mb (1000k or 1,024,000 positions) of memory.
Soon after the 9480 was removed DP added a second 90/40 taking the County into a multiple mainframe environment. This allowed for the separation of development and production work. They were known as the Red (production) and Blue (development) systems. A significant increase in the use of remote terminals also occurred during 1978/1979. Optical Character Recognition (OCR) technology was also added using scanner equipment from Keytronic and a Sperry Univac data entry mini-computer known as Computer Aided Data Entry (CADE) system. The initial phase of implementing a Word Processing system using Xerox 860 Word Processor equipment was also initiated in 1979. The development of a Computer Aided Dispatch (CAD) system was started in 1979. Some agencies also started using Control Program for Micro Computers (CP/M) on Sperry Univac terminals with Intel computer processors in them to run applications like WordStar for word processing and SuperCalc for spreadsheets.

- **1979/1980**: The development of the Computer Aided Dispatch (CAD) system continued throughout 1980. After looking at many other localities it was determined that we should develop our system in house so that it capabilities could be tailored to the County’s needs. CAD used a distributed computing model. The terminals used were connected to a controller that contained an Intel 8080 computer processor. This allowed us to store our screen formats and do the data capture and editing right in the terminal controller. This allowed the screen formats to be displayed in the blink of any eye (sub-second). The length of time to display the data entry screen formats was the largest complaint that we observed in other systems. This made Henrico among the earliest adopters of distributed computing and made our CAD system one of the best in the nation.

- **1980/1981**: The first version of our CAD system went live on May 12, 1981 and provided dispatching for police. The Personal Computer (PC) was introduced by International Business Machine (IBM) with other manufacturers following suit with their own versions of IBM compatible PCs. IBM had given a new small company, Microsoft, a contract to develop the operating system for their PCs. When Bill Gates of Microsoft negotiated that deal he retained the right to sell the operating system under the Microsoft name as well. This was probably the best decision that he ever made. IBM called the operating system PC-DOS and Microsoft called it MS-DOS. The rest is history. This eventually led to Microsoft becoming the largest software company in the world and to Bill Gates becoming one of the richest men in the world. Our professional word processing environment grew significantly in 1981 with most agencies receiving Xerox 860 systems. A major new financial system, FAMIS, was implemented in 1981 in time for the preparation of the 1982 fiscal year. Our communications network surpassed 100,000 transactions in a day for the first time in 1981.

- **1981/1982**: To better support our Computer Aided Dispatch (CAD) environment a third mainframe was added and was known as the Yellow system. Fire dispatching was added to our CAD application during 1982. Our first Ethernet network (Local Area Network [LAN]) was deployed for our Xerox Word Processing environment. Our first electronic messaging system was introduced. It was developed in house and was known as the Electronic Memo System.
1982/1983: Our terminal communications network surpassed the 200 mark and performed over 135,000 transactions per day. To accommodate growth of the computer room the Analyst/Programmer staff were relocated to the third floor of the C-South wing of the Administration building. The official organization of a new section within Data Processing was set up in 1982/1983. It was called the Information Support Center and it housed several computer resources like Personal Computers (PCs), Xerox word processing and graphics processing systems (known as a Star 8010), online terminals, a digital plotter, scanners, laser printers, etc. These resources were shared, on a scheduled basis, by all agencies. Three employees staffed and provided training on these resources. Our Fire CAD system went live on March 15, 1983.

1983/1984: 1984 saw a major upgrade to our mainframe computing environment. We replaced our three 90/40s with three System 80 Model 8 mainframes from Sperry Univac. During this same time period Sperry Univac changed their name to Sperry. The new computers more than doubled our computing power and storage. We were especially excited about these mainframes having 4mb (4 megabytes [million positions]) of memory. Several new major applications were implemented. These were the Personal Property and License System (PPALS), Payroll/Personnel Management Information System (MAPS), Library On-line Automation System (LIONS), Perpetual Parts Inventory System, On-line Permit Tracking System, and Jail Management Information System. The number of remote terminals surpassed 300. Over 140,000 transactions per day. Always-on disk storage exceeded 10 gigabytes (billion characters). A classroom with four PCs for teaching PC classes was added to the Information Support Center. A PC workgroup local area network (LAN) was deployed using technology from a company known as LANtastic. Installed PCs exceeded 100. These PCs contained a communications board in them that let them serve as an online terminal also.

1984/1985: The staff size reached 58 by 1985. Always-on disk storage grew to 12 gigabytes. The number of remote terminals surpassed 400. Over 145,000 transactions per day. This is the year where requests for on-line applications exceeded the request for batch (overnight) applications. 75 additional PCs were added to the network and file uploading and downloading to PCs was introduced. Over 150 County employees received hands-on PC training during 1985. PCs were connected to the Xerox Ethernet LAN to allow data exchange. The E911 interface in CAD went live on June 1, 1985.

1985/1986: The staff complement reached 59. Always-on disk storage grew to 15 gigabytes. The number of remote terminals surpassed 450. Over 180,000 transactions per day. Installed PCs exceeded 180. Over 450 County employees received hands-on PC training since the opening of the DP classroom.

1986/1987: The staff size reached 59. Mainframe computers were upgraded and a fourth mainframe was added. Over $3 million worth of leased equipment. It became known as the green system. The number of remote terminals surpassed 550. Over 250,000 transactions per day. Installed PCs exceeded 190. Eighty-four buildings were connected to the network. Introduction of connecting terminals and PCs to the network over twisted pair cabling instead of over the twenty-five pair cabling.
previously used. This led to a major reduction in cost of connecting to the network. 338 employees received training in the Information Support Center classroom. The Information Support Center introduced a LAN based file server using technology from a company known as Novell. This network was Ethernet based. Ethernet eventually became the county standard and the de facto standard for nearly all modern networks. It was a 10mb (megabit/million bit) shared local area network. The initial Jail Management System (JMS) was implemented.

- 1987/1988: The staff size reached 60. The number of remote terminals reached 675. Over 300,000 transactions per day. Installed PCs exceeded 250. Ninety buildings were connected to the network. The County network was connected to the State of Virginia network allowing direct access to state applications using County terminals and PCs. Henrico was one of a very few localities who could use both the State’s Sperry mainframe computers and the State’s IBM mainframe computers. Other localities using IBM mainframe computers could only connect to the State’s IBM computers. IT began extending its Ethernet LAN to other departments using network hubs and bridges from Hewlett-Packard. The LAN remained a shared 10mb network. The initial version of a Police records management system (PMOI) was implemented.

- 1988/1989: The number of remote terminals reached 917. Over 320,000 transactions per day. Installed PCs exceeded 350. Ninety-three buildings were connected to the network. The Ethernet LAN continued to grow. Public kiosks were added to the network to help visitors. Radio based communications was added to the network infrastructure. The Information Support Center added a heavy-duty color inkjet printer to the list of shared resources. EMS was added to CAD and was implemented on June 1, 1989.

- 1990/1991: The number of remote terminals reached 1,070. Installed PCs exceeded 400. Ninety-seven buildings were connected to the network. Thirty-two applications ran on the four mainframes. Four UNIX based servers were added to the computing resources. Data Processing won three National Association of Counties awards and one City & State award for excellence and innovation in information and technology. The Ethernet LAN continued to grow. One June 1, 1991, the CAD Sperry Univac UTS400 terminals were retired and replaced with new dual screen PCs running a new Cad/PC client program. This was also developed in-house.

- 1992-1993: The number of remote terminals reached 1,125. Installed PCs exceeded 480. Ninety-eight buildings were connected to the network. Thirty-three applications ran on the four mainframes.

- 1993/1994: Three additional awards were received from the National Association of Counties. Color laser printing technology was added to the resources being offered in the Information Support Center. The county stopped purchasing proprietary terminals and went to only purchasing PCs. Remote wide area network (WAN) locations began to move to Ethernet based LANs also.

- 1994/1995: The building of an all fiber backbone was started in 1994. The focus was the three main campuses in the County, Government Center campus, Eastern Government Center campus and Woodman Road campus. A wiring closet clean up
and upgrade also started in 1994. This led to the retirement of all LANtastic and Novell networks and changed the flat shared LAN into a much more robust switched and routed network. Cisco switches and routers became the new standard for all county LANs. Previous to this period the County used telephone grade wire for connecting terminals and PCs with terminal emulators to a device known as a multiplexer. The first Internet connection was also added to the network providing Internet access to all departments connected to the county LAN/WAN environment. The new Acquisition Information Management System (AIM) went live allowing individual agencies to complete their own purchase requisitions on-line eliminating staff hours and mounds of paper work.

- 1995/1996: A new Document Imaging System went live. The system allowed administrative staff in the County Manager’s office to scan documents, agendas, plans, correspondence, and other essential files into the County’s computer systems, thereby eliminating the need to file, stack, and store endless amounts of paper. A new Virtual Human Resource Information System also went live allowing employees to access their own personnel files online. Some internal reorganization was also done in DP that year. The network fiber backbone was completed for the three main campuses. DP staged a web site on a Sun Netra Workstation in the Fall of 1995. A public site was available through the Richmond FreeNet that Fall also. The "Henrico Internet Project" team first met in December 1995. The County’s www.co.henrico.va.us web site officially went live on January 1, 1996. Internet based e-mail went live in the Fall of 1995 using sendmail on the Sun Netra Workstation. Initially there were about 100 users. In the Spring of 1996, Internet based e-mail became available County-wide using Post.Office on a Windows NT server. The JMS system was the first system ported to Tip/ix which ran on a UNIX server.

- 1996/1997: Data Processing received a new name. It became the Department of Information Technology (IT). A new Police Mobile Data Unit project went live where each patrol car received a mounted laptop PC making information retrieval instantaneous for on-duty officers. CAD and the Police Master Operational Index (PMOI) systems went to a scheduled downtime of only once per week. Since multiple police applications were now involved the in-house name of YCAD was changed to YPSB. These names stood for yellow system CAD system to yellow system public safety systems. Planning for the Year 2000 or Y2K got under way also.

- 1997/1998: Y2K preparation continued. A new client/server Emergency 911 Computer Aided Dispatch system went live allowing the system to ascertain the nature of the caller’s emergency, determine the location, and dispatch the appropriate response team and emergency vehicles. This included the replacement of the CAD/PC client application with a rewritten client application. CAD/PC was written in the “C” programming language and the new client was written using the Microsoft Visual Basic 6 (VB6) programming language. This project included placing mobile data computers (MDC’s) in police vehicles. The mobile data project was about a five million dollar project. IT also took a major role in the massive Geographic Information System (GIS) acquired by the County. IT introduced
Microsoft Exchange as an additional email service in the Fall of 1998. This initial implementation allowed two people per agency to use Exchange.

- **1999/2000:** In the Spring of 1999 the use of Exchange for email services was expanded for agencies that could fund their own licenses. A quote from the Annual Report: “New Year’s Eve 1999, the hustle and bustle at the Information Technology (IT) Department looked like anything but a county holiday. As the clock inched closer to midnight, activity increased. Midnight came, and went. No mayhem. No blackouts. No spontaneous combustion. All was well. It was the best compliment the staff in IT could have hoped for – that all of the preparation, the anticipation, the long hours, the lines of code, the contingency plans, checks and balances, test runs – it all worked. To the naysayer, the “Y2K hoo-ha” was all for naught. But for the real people behind the real potential problems, a non-event meant a job well done.”

- **1999:** also saw the completion and implementation of a countywide Local Area Network (LAN)/Wide Area Network (WAN). Gone were all of the vendor proprietary network environments.

- **2000/2001:** DARWIN -- a Data Warehouse of police historical data went live. The full implementation of a document management system known as Filenet was accomplished with the Manager’s Office and Police being the first groups to take advantage of the elimination many paper documents. The purchased product known as Tidemark also went live for our Community Development departments.

- **2000/2001:** People who were interested in getting up-to-the-minute traffic information in Henrico County needed only to click on the County web site to be in the know. IT also interconnected the three main campuses, Government Center, Eastern Government Center and Woodman, with high speed, gigabit (billions of bits), networking services from Verizon. This allowed employees and all three campuses to enjoy the same response time.

- **2001/2002:** IT had a changing of the guard. Steven M. Lewis was appointed to succeed Brian D. Wantling who retired after 26 years of service.

- **2002/2003:** IT completed a multi-year process of migrating the County from proprietary mainframe computers to open standards state-of-the-art rack mounted servers. During the upgrade IT also increased the County's Internet speed capabilities (bandwidth) by a factor of 15 times faster. Centralized virus and spam email protection was also introduced into the network. As of 2002/2003, IT's network consisted of more than 100 buildings and 3500 workstations supporting 33 major applications. CAD was among the applications that were migrated to a UNIX platform in 2002. As part of the move to a new server, the scheduled down time was reduced to about ten minutes per week. In 2003, IT had to migrate off of Post.Office for email services because the company sold out and no longer supported email. More than half of the email users migrated to a new email service known as CommuniGate Pro. The remaining users migrated to Exchange for email services.

- **2004/2005:** The Oracle e-Business Suite’s Financial System was implemented during this time period. A new Field Interview Reports System for Police was also completed and went live saving many hours previously spent on paper work. The migration to Exchange for email services was completed in April 2004.
• 2005/2006: The County generated and handled about seven terabytes (that's seven trillion characters) of data as of 2005. All of that information needed a place to stay. Previously, many County agencies managed a lot of their own data storage requirements using agency servers and PCs. This carried the risk of losing data. IT started the installation of a new storage array from EMC Corporation and between 15 and 20 new servers to create a large central repository. In most cases, agency servers were eliminated and IT accepted the responsibility of backing up and managing the information needs on behalf of the agencies. IT added a lot of network redundancy in 2005/2006 providing multiple connections to wiring closets to make the network more resilient and reduce the risk of network outages. During the summer of 2005, IT received funding to migrate all remaining email users to Microsoft Exchange. The CAD system was migrated from UNIX to Linux during April of 2006.

• 2006/2007: Several new systems were introduced in 2006/2007. The new “Wwatch” System manages all criminal warrants issued in Henrico as well as warrants from other jurisdictions requiring service on county residents. There are between 6000 and 7000 criminal warrants on file at any given time. The new “Debt SetOff” System gives Finance, Public Utilities, Recreation and Parks and other participating agencies the ability to automatically submit and track difficult-to-collect debts with the Virginia Department of Taxation. The automated process allowed the County to “get-in-line” rapidly with the state agency, which captures tax refunds and other money owed to localities on a first-come, first-served basis. IT also added a second Internet connection to help employees who use the Internet in their day-to-day operations. This added much needed bandwidth since the first line was at a 70 to 80% utilization.

• 2007/2008: IT implemented a new custom in-house developed Computer Aided Dispatch (CAD) system known as CAD24x7. CAD24x7 provides a cutting-edge command and control system for the county’s E-911 dispatch center. It tracks calls, analyzes their location, determines the closest available Police, Fire or EMS units and recommends which units to send. It records data such as response time and incident resolutions to further speed the handling of emergency calls. CAD24x7 requires no down time, operating over multiple servers on the county’s enterprise network for greater redundancy and resilience. The system was made more resilient by locating additional servers in the Communications and Training Center where the E911 Center is housed. This allows CAD to operate even if there is an outage in the IT data center. The mobile data terminals have grown in number until now there are over 500 police cars and over 60 Fire response vehicles that have them mounted in the vehicles and run on a “24x7” basis. A new legislation tracking system was also introduced to help County officials better track and discuss pending bills. The new system combines a blog function with e-mail, creating a running dialogue on legislation that allows users to view each other’s comments and ideas. Users can also view a bill in its entirety. The Communications section of General Services was relocated and became part of the Information Technology team. This brought responsibility for about 81 phone systems supporting about 5000 telephones to IT. Four of the 81 phone systems are large private branch exchange (PBX) systems. These hosts about 4000 of the 5000 phones. The remaining phones systems are
small key systems that primarily support remote sites like individual fire stations, Recreation and Park facilities, etc.

- **2008/2009:** Another in-house developed police application that went live is known as the Police Reporting and Information Management Enterprise (PRIME) system. PRIME provides an officer access from a single launch point to a range of records, including incident crime reports, warrants, arrests, drug logs and field interviews reports. A considerable effort was made to reduce phone communications cost. Nearly one million dollars was saved in this time period by getting rid of taxes that the county was not obligated to pay, cleaning up other billing issues, eliminating unused or unneeded leased communications lines and converting other lines to less expensive services. The EMC disk storage array was replaced with a storage array from Network Appliance (NetApp).

- **2009/2010:** A major issue raised its head in 2009. Nortel, the county’s phone system vendor went bankrupt and was bought by a firm named Avaya. Avaya announced that it intends to discontinue every phone system and phone that the county uses. Our current environment will be supported through November of 2015. This triggered an intensive research project of trying to determine the best solution the county should adopt for it voice based communications. Even though a specific vendor or solution has not been chosen, IT has determined that our next voice communications systems should be converged with our data network allowing one network to support voice, data and video. This environment will require a network equipment refresh of our aging network equipment. IT made significant strides in reducing administrative overhead as part of the county’s green effort through the use of virtual servers. Previously, individual county applications ran on their own server, often using a minimum amount of the server’s computing power but nevertheless requiring a full amount of electricity to operate and cool the servers. Two-hundred and sixty (260) servers filled racks in IT’s data center. Currently we have reduced that number to 160 physical servers and 100 virtual servers. These 100 virtual servers live and run on 7 physical servers. We have come a long way from our former environment of 4 mainframe and about 6 smaller Windows and UNIX servers. Five new applications also went live in this time period. The effort to reduce phone communications cost continued in this time period and led to saving the county and public schools an additional $500,000.

- **2010/2011:** IT saw another changing of the guard in early 2011. After the retirement of Steven Lewis, Tom Owdom, who was the Assistant Director, was appointed IT’s new Director. As of this writing, a new assistant director has not been put in place. A major network equipment refresh is scheduled to begin this year in preparation to support a converged network capable of carrying voice, data and video traffic. Research continues on a replacement phone system. That project is planned to follow the network equipment refresh. A new 911 center phone system was selected in 2010 after an RFP process and is currently being installed. A GPS based unit tracking capability was added to the mobile data system for Police and Fire and interactive maps displaying the current locations of the units were produced in a joint project involving IT personnel and the GIS Office.