

Metropolitan Government of Nashville & Davidson County

ITS Annual Report

A Word from the Chief Information Officer

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Technology provides the basis upon which Metropolitan Government departments and agencies serve the citizens of Nashville and Davidson County. Whether a Metro Police officer is responding to a call, a citizen is looking up a trash pickup day on Nashville.gov or a Metro Council member is answering an email, each of these tasks require reliable, sustainable and secure technology to complete.

While each Metro department has its own unique needs, the Information Technology Services (ITS) Department exists to serve the common needs that exist across the government. The scope of technology utilized by

the Metro Government and managed by ITS includes network communications, data center operations, information security, desktop computer support, television broadcast and software applications development, among our many business lines.

In this first ITS annual report, ITS' leadership team highlights a number of the initiatives and programs of ITS to provide you a feel for the work ITS does for Metro.

Among other articles in this issue:

You'll read about how Kiva, Metro's land management technology, is a supporting technology for processes in 26 departments and agencies, including the

generation and collection of Metro's tax revenues.

You'll learn how information security has grown from an initiative of Mayor Karl Dean's into a robust program that protects information assets and educates Metro employees.

You'll read how a single technology, server virtualization, has saved Metro millions of dollars to date, and has the potential to save millions more in the future.

Supporting this vast range of technology are teams of dedicated technology experts assigned to ITS' various technology service areas. I am proud of these 134 employees and their commitment to the ITS mission which ultimately serves our citizens. Metro ITS is the combination of these teams, creating a cohesive, structured organization that continually supports Metro government business by providing enterprise solutions in an efficient and effective manner and implements secure, cost-effective information technology solutions.

Keith Durbin
CIO/Director of ITS



Metro ITS' Executive Leadership team, from left to right: Assistant Director Dawn Clark, Division Manager Mary Newton, Assistant Director Margaret Keck, Director Keith Durbin, Division Manager Mike O'Rear, Division Manager Lori Smiley, HR Manager Mary Alice Emigh

Kiva Supports Land Management for Metro

The Kiva Land Management system has been the flagship computer system for the Codes department for nine years. Kiva contains and manages the master records of parcel ownership and valuation for 236,841 land parcels in Metro. This vital information is supplied from Kiva to many governmental departments who require property data in their day-to-day business, including the Tax Assessor, Planning, Public Works, Water Services, and the MNPD. ITS staff provides the technical implementation and support duties around KIVA for these ITS customers.

Using the Kiva system, Codes and other departments are able to issue 40,000 permits yearly in the building and construction trades. 26 departments use Kiva to review and approve these permits. Kiva holds nearly two million permits dating back to 1975. Property violations are also tracked through Kiva, with 170,000 viola-

tions on record and over 16,000 new cases added each year.

Kiva is at the heart of the Planning Commission's mapping work. The information from Kiva is merged with graphical map information to present useful tools to the public such as current and historical property ownership, assessment, permits, and zoning data.

Kiva also plays a vital role for property tax processes. Ownership and assessment information is transferred from Kiva into the Metro Trustee's tax system to generate annual property taxes totaling approximately \$793 million dollars. This amount represents about half of the government's annual budget.

After many years of successful and productive use within Metro Government, the Kiva system is reaching the end of its useful life. The Metro Codes Department, in cooperation with ITS and other departments and agencies, looks toward a major upgrade in the coming year.

Today, the technology that is the basis of Kiva is antiquated in computer terms. Metro is one of a handful of cities still using this system, and the end of support for the system from the vendor, Accela, will be in 2014.

In addition to the obsolescence issue, there is demand from citizens for governmental transparency and ease of use by delivering information through the internet. The current Kiva system was written at a time when the internet was in its infancy. Many technologies like the iPad and the iPhone take advantage of these new internet technologies.

The next version of Kiva will address these new need and position Metro to continue to provide effective land management for years to come.

Codes and other departments use Kiva to issue 40,000 permits yearly



Metro councilmember-at-large Ronnie Steine presents **Metro CIO Keith Durbin** with a Metro proclamation recognizing the Metro's 2011 Digital Cities Award.

Metro's Primary Data Center: The Heart of IT Services

ITS provides critical services at some level for every Metro department and agency. The heart of these ITS services is the space that is known as Metro's Primary Data Center.

Since the early 1970s when the first main-frame computers came into use within the Metro Government, one or more data centers have acted as host to the important systems and data of Metro. In those days, while important, the fundamentals of business didn't entail a dependence upon data and connections both internal and external, as we have today.

Today's Primary Data Center, to which Metro ITS migrated in the spring of 2010, is a critical hub for communications, systems and data storage. It was designed in 2009 with reliability, availability of services and security in mind, while striving to keep overall costs at a minimum.

Metro's primary data center houses almost 150 Terabytes of data. This is equivalent to over 63 billion single-spaced printed papers or over 14 times the printed collection housed in the US Library of Congress. The data is transmitted within the data center over more than 30 miles of fiber and copper cabling where it is then transmitted across Davidson County on Metro's private network, or to our citizens and partners across the country.

Within Metro's primary data center ITS hosts 545 servers, with 40% of them virtualized (*see the article on virtualization later in this report*). Due to the substantial amount of equipment required to run a data center, power and cooling are major important considerations. With those in mind, the data center is built with enough fault tolerance designed and built in to those systems to allow for unforeseen outages and planned equipment repair without loss of access to critical services

and applications. The same built-in fault tolerance is in place to support network connections to Metro's private network and to the world at large.

Building and maintaining a data center that provides stability and redundancy was an enormous undertaking and one that was planned to scale to meet the needs of Metro for many years to come. As a result, significant cost savings will continue to be realized across Metro by eliminating the need for substantial future spending to build similar space for servers and other IT equipment.

The Hospital Authority was the first example of this premise in action. The Hospital Authority moved their server and data center functions into Metro's primary data center and are able to take advantage of the capabilities of the facility while reducing costs to Metro as a whole by almost \$250,000 per year.

Metro 3 Broadens Reach with the Metro YouTube Channel

Metro Nashville operates four Public Educational and Government (PEG) cable channels. Of those 4, Metro 3 serves the citizens of Nashville and Davidson County in a unique way by providing video insight into the workings of Metro's government. In addition to live Metro Council meetings, Metro 3 provides live and prerecorded meetings from many Metro boards, commissions and committees. Special events are also programmed such as Mayor Dean's State of Metro Address or informational broadcasts in the event of disasters such as occurred during the 2010 Nashville floods.

For those who don't have access to cable television, Metro 3 is also made available via live streaming at Metro's Nashville.gov

site. For those who miss meetings, recordings of meetings have been posted to Nashville.gov for viewing at the website of the responsible Metro department.

In spring of 2011, Metro 3 introduced the Metro YouTube channel as a means to broaden the reach and availability of Metro 3 programming. Metro's YouTube channel has grown from a little known feature to a significant source of information for citizens. The channel is located at <http://YouTube.com/MetroGovNashville>. As of May 2012, the channel has over 225 archived videos and has received over 11,000 individual video views to date.

One indication that the Metro YouTube channel is increasing the reach of Metro's governmental insight is that to date 21.1%

of all video views come from mobile devices such as smart phones or tablets.

Current Playlists on the Metro YouTube channel feature meetings from the Metro Council, Planning Commission, Metro Nashville Public Schools, Sports Authority, and the Historic Zoning Commission along with special features like the State of Metro Address and Nashville History videos.

In addition to the enhanced availability to consumers, Metro also takes advantage of YouTube's free video storage. This allows ITS to pass savings on its Metro department customers by reducing the amount of data stored on Metro servers, with a corresponding decrease in storage fees.

Metro Moves to iProcurement for Purchasing



The Procurement Division of the Metro Finance Department, working with Division of Accounts and ITS, successfully migrated Metro's system of purchasing to the new iProcurement System. This Oracle-based solution fully integrates with our current financial system. The transition from the old system was made on May 14, 2012.

The two driving forces are Metro's suppliers and departments. Metro suppliers will operate within the iSupplier application and Metro Departments will operate within iProcurement.

In addition the general public can easily see solicitations,

awards, and resulting contracts via integration with Nashville.gov.

Suppliers register through the iSupplier portal, upgrade business status and contacts, view upcoming solicitations, submit offers, view competing offers when the results are listed and see the awards. Small and Veteran Disabled- Owned, Minority and Woman-Owned Businesses benefit from the level playing field created by online solicitation capabilities.

Departments submit purchase requests through the iProcurement portal, send funding information, attach files and drawings, participate in proposal

evaluations, view the solicitations, and see the results of supplier's offers. Approvals and contract filings are tracked in real-time view of the requests they submit. If under contract, they can issue PO releases.

As a part of the migration to iProcurement, 14,936 vendor contact records with 536 vendor contracts were converted. Those vendors had 40,180 products and services.

The focus of iProcurement is to make the purchasing process more accountable and transparent to Nashvillians as Metro Government spends tax dollars in order to operate Metro departments and agencies.

Nashville.gov Next Generation to be Released this Year

Metro Government has had a web presence since 1994, with Nashville.gov as the face of Metro Nashville to its citizens since 2001. While the delivery of content has been managed consistently since then, Nashville.gov has undergone only one minor redesign in 2007. In 2012, Nashville.gov is left showing its age. ITS is currently leading a coordinated effort with Metro departments to update the look and features of the sites on Nashville.gov.

Nashville.gov's mission for this upgrade is simple: to make it easier for citizens to connect with and understand both the investments that Metro Nashville has made (in things like parks, libraries and police and fire services) and the functions of government, while at the same

time enabling Metro departments to engage citizens faster and more easily in providing those services.

As well as a new fresh look, the next generation of Nashville.gov will be designed to take full advantage of technologies such as social media integration, video, and mapping. The site also features responsive design that allows for much easier use on a variety of viewing devices, from phones to tablets to home PCs.

With 15,000 pages of content spread over the 158 sites that comprise Nashville.gov, Metro departments and agencies will work through the summer and fall to migrate content into the new site. Watch for the release of the next generation of Nashville.gov this winter.



ITS fielded a team of 27 employees and friends to walk in the Mayors 5K Walk held on Sunday, November 19, 2011.

ITS at Work for Metro stats for 12 months ended April 30, 2012

- Provided IT services at some level for 59 Metro departments and agencies (ITS' customers)
- Managed an operating budget of over \$15 Million
- Supported critical IT, network and telecommunications equipment in 270 Metro locations
- Completed 234 total technology and communications projects
- Operated a primary and backup data center for Metro IT services
- Maintained 98 uninterruptible power supplies to ensure the power stays up for critical IT systems
- Managed 143 terabytes of stored data
- Hosted 333 physical and 246 virtual servers
- Managed information for creation of tax bills for 236,841 parcels of property
- Supported 57 distinct software applications
- Supported 125 SQL Databases
- Trained 4,849 Metro employees on basic security
- Secured Metro's data by managing 55 firewalls
- Managed malware and patching for over 7,000 computers
- Detected and stop surfing to 782,252 malicious web sites
- Managed 12,704 network connections
- Managed 9,032 phone lines
- Managed 2,500 Metro cell phones
- Supported 4,734 desktops and 1,685 laptops
- Replaced 1,736 obsolete and end of life desktops & laptops
- Sent and received 375,590,757 mail messages
- Blocked 281,555,336 SPAM messages (94% of all received)
- Managed over 3,000 VPN Accounts
- Staffed the ITS 24/7 Technical Support Service Center (helpdesk) for 8,760 hours
- Handled almost 42,000 phone calls to Help Desk requesting service
- Processed 760 Change Controls
- Processed over 9,000 Nashville.gov website updates
- Hosted 4,911,688 visits to Nashville.gov
- Hosted 12,624 average visits per day to Nashville.gov
- Hosted 5136 unique visitors per day on average to Nashville.gov
- Metro 3 aired 515 different programs for a total of 6174 hours of programming
- Posted 212 videos to the Metro YouTube channel
- PEG Studio trained 97 producers in video production over 1248 hours on creation of video content for NECAT PEG channels 9, 10 and 19



Metro ITS Accepts 3rd Place Digital City Award for Metro

On November 3, 2011 e.Republic's *Center for Digital Government* and Digital Communities Program announced that Metro Nashville took the 3rd spot as a top-ranked digital city governments in the 10th anniversary Digital Cities Survey. The survey focused on results achieved by cities, via the use of technology, in operating efficiencies and realizing strategic objectives despite current fiscal constraints.

"I'm certainly proud that Metro has received national recognition for the technology work that contributes to the success of our Metro departments," said Metro's CIO Keith Durbin. "Metro is fortunate

to be able to continue investment in innovative technologies such as those used in the Nashville Area Zone Alliance (NAZA), the Emergency Communication Center's nation-leading computer-aided dispatch system, and the map-based Development Tracker found on Nashville.gov."

"Cities that are investing in technology are capturing cost savings that are critical to continuity of operations and their ability to meet higher demand for services," said Todd Sander, director of Digital Communities. "The highest-ranking cities in the survey showed great strides in consolidating, enabling shared services, government

transparency and communications interoperability. We applaud these innovators as they work in the spirit of collaboration to provide extraordinary value to constituents despite budget setbacks."

The survey was open to all U.S. cities with a population of 30,000 or more. Nashville placed 3rd in the cities with 250,000 or more population.

The award was received by Metro Councilmember-at-Large Ronnie Steine at a special awards ceremony concurrent with the National League of Cities annual conference in Phoenix, Arizona on November 11th, 2011.

Advancing Information Security for Metro

As information technology has become a fundamental component for doing business and providing services for Metro departments and agencies, so too has the criticality of maintaining the security of Metro's and our citizens' information. Mayor Karl Dean quickly recognized the importance of the task "to maintain the confidentiality and integrity of information systems and high standards of information security" for Metro Government. Executive Order No. 4 established the *Information Security Advisory Board (ISAB)* which is a mayoral committee, staffed by private sector and state information security executives, that has served as an advisory panel and sounding board for Metro since 2009.

Additionally, in 2010, Mayor Dean issued Executive Order No. 38, which established the Metropolitan Government's Information Security Management Policy (ISM Policy). This Executive Order formalized the policy and governance work that had been and is still ongoing in Metro, led by ITS.

One component of EO 38 was the creation of the Information Security Steering Committee (ISSC). This 11-member steering committee is comprised of departmental representatives that provide a broad range of IT services and includes the Nashville Public Library, the justice community and the Metro Nashville Police Department as well as revolving members from other departments.

Through the work of the ISSC members and volunteers from department and agencies across Metro, 13 policies have been released to date. These are based on the ISO 27000 standard for information security. Additional policies are currently under development, some of which are scheduled to be released this year. Concurrent with policy release is the release of implementation plans which provide direction and tools for departments.

Although many policies are specific to particular areas of technology and apply only to explicit job functions, several affect all Metro employees and contractors such as Metro's *Acceptable Use of Information Technology*

Assets Policy. All of Metro's information security policies are found on Nashville.gov at http://www.nashville.gov/its/ism_policies.asp.

Another key component of an effective information security program is security risk awareness. All Metro employees and contractors must complete information security awareness training as part of mandatory Metro employment training. The awareness campaign is led by the Department of Human Resources with the Department of General Service and ITS assisting in the process that created an online *Basic Security Awareness Training* for all Metro employees. In the seven months the program has been in place well over 54% of general government employees have completed this training.

Information security is a moving target, thus ITS and the ISSC must continually adapt and respond to new threats and opportunities in this space. In the coming year, we will address mobile device management, the impact of the Bring Your Own Device (BYOD) philosophy in business, and the continuing presence external threats and attacks.

The success of a security program requires the commitment of everyone in Metro. We are extremely thankful for the help that numerous departments and agencies have already provided and we look forward to continuing this initiative with that same commitment.



Mayor Karl Dean enjoys pancakes served by ITS executive management team members **Houston Runion** and **Mary Newton** as part of ITS Employee Recognition Day on July 29, 2011.

Network Backbone Upgrade Planned

Metro departments and agencies are run via data, and that data streams from office to office via the Metro Government private network. Voice (telephone), data and video are all transmitted via the Metro network which is a complex system of cabling and equipment. Information is transferred between buildings, and then inside the building to the cable plugged into the back of each Metro computer and many Metro telephones. The portion of the network that delivers information between buildings is referred to as the “network backbone.”

All Metro general government and judicial departments and agencies utilize Metro’s private network. This network is maintained, managed and supported by ITS, and the cost of doing so is allocated to departments via internal service fees.

Metro’s current network backbone was installed in 2001. The network has served Metro well over time as it has been carefully monitored and upgraded through the years. This network is now in need of upgrading. Portions of the critical equipment which transmit traffic have reached an age where they are no longer supported by the vendor because they have reached end-of-life and the technology is obsolete.

Additionally, due to the dramatic increase in network traffic since its initial installation in 2001, the equipment is reaching the point of saturation and will not be able to keep up with the ever increasing demand for the transport of large amounts of data.

In 2012, ITS is making a capital budget request of approximately \$5.2 million dollars to upgrade the network backbone. ITS feels that this is necessary to ensure that departments and agencies can reliably transport their data as required in order to serve the citizens of Nashville and Davidson County.



*During the 2011 Holiday season, ITS employees worked in conjunction with the Pencil Foundation, helping kids at **Glenn Elementary School** make Christmas Cards for their loved ones. In addition, the children were learning how to write and sell books. The money they raised was used to purchase gifts for loved ones.*

The Impact of Server Virtualization for Metro

In late 2006, ITS began evaluating the possible uses of a technology called *server virtualization*. Virtualization allows the creation of software-based servers inside a physical server's memory that provide the same functions as a real, physical server. Expected significant cost-savings was the primary driver for this project, as this technology allows a single physical server's components such as memory and processing power to be shared across multiple virtual servers, thus reducing the budget allocated for server procurement.

Server virtualization also allows servers with significant needs for memory or processing power to have it dynamically added or removed while eliminating any waste of those resources by servers that require little processing or memory.

An additional critical benefit of virtualization is the increase in reliability and availa-

bility for the applications running on those servers. This technology provides for the seamless transfer of software from one server to another, at will or on demand. As a result, most updates and changes to virtualized applications do not require any outage time for customers. In fact, during the migration to Metro's primary new data center, those customers whose applications were running on a virtualized server experience zero downtime during the server moves. In fact, Metro's virtualization infrastructure has not incurred an outage in over two years.

Today in 2012, the most compelling reason for the use of this technology has proven to be cost savings. Eliminating the number of physical servers has decreased the substantial costs associated with the equipment itself, as well as associated licensing, power, heating and cooling costs of the data center.



In the first year we were able to support more than 60 virtual servers. Over the last four years we have increased that number to 246. The result of this move allowed Metro to avoid costs of approximately \$2.5 million.

Currently there are over 120 servers in the data center that have the potential to move to the virtualization platform. The result of that move has the potential to save Metro approximately \$1.2 million over the next five years.

The ITS Mission Statement: *To provide information, communication, and business solutions to the departments and agencies of the Metropolitan Government so that they can achieve their business objectives and exceed the expectations of the citizens we all serve.*

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