

# ITS Strategic Roadmap – FY16

## **Databases**

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Date last updated: 1/21/2015

## **Background**

Metro Government's departments and agencies use a combination of Microsoft SQL Server versions (2000, 2005, 2008, and 2012) and Oracle versions (9i and 11g) databases to organize data within both enterprise and department-focused systems. Support for both platforms is provided by ITS through database creation, management, upgrades, backups, restore and vendor support. Microsoft Access databases are also supported for legacy departmental applications. The applications or systems using Oracle databases are overall enterprise systems which are addressed through separate roadmaps and are therefore not specifically mentioned in this roadmap's drivers or goals.

283 live production databases and 222 development and testing databases are supported serving all departments of Metro Government either directly or indirectly.

The major systems and stakeholders are:

- Land System – Codes and 21 other departments;
- Property Assessors;
- iProcurement – Finance Procurement;
- Imaging – Schools, Finance, HR and others;
- Tax system – Trustee;
- Cityworks – Public Works;
- Legal-Department;
- Health Department;
- Human Resources;
- Nashville.gov;
- Social Services;
- Election Commission;
- Metro Action Commission;
- Metro Clerk;
- Transportation Licensing;
- Human Relations;
- Finance-Collections;
- Jean Crowe Advocacy Center.



## Current Strategic Drivers

1. **Technology Past End of Support – SQL Server 2000 (April 2013)** (High) – Forty-six (46) databases are still at the now obsolete SQL Server 2000 level, with thirty-one(31) in a single department. This is due to mission-critical systems within departments that are prohibited from upgrading due to application vendor issues or internal customer department staffing challenges. Each of these databases presents a potential business risk in the way of system downtime because as time passes there is less expertise in the SQL Server community to support/troubleshoot any new issues with this version. Further, Microsoft has issued a blanket statement that SQL Server 2000 is not supported on any of the newer Windows operating systems such as Server 2008, Server 2008 R2, Server 2012, and Server 2012 R2. Because Windows Server 2003 is soon to become unsupported, any systems running SQL Server 2000 will be unsupported from an OS and SQL Server level thereby creating a risk for new OS vulnerabilities/bugs.
2. **End of Support Technology - Windows 2003 Operating System (7/14/2015)** (High) – 40% of the 283 production databases are on the Windows 2003 Operating system. For these databases and systems that use them, there is a shortage of skills and resources needed within both the departments and ITS database division because in addition to the technical aspects of upgrading the database, the upgrades expand into complicated coordination efforts with departments, vendors, and internal ITS. These databases, once past support end of life, will present a business risk of system downtime because Microsoft will not be addressing any new vulnerabilities or bugs.
3. **Demand for Secure Government Systems** (High) – With massive data breaches in the news on seemingly a daily basis, we must strive at all times to protect the security, availability and integrity of all databases entrusted to our management.
4. **End of Life Hardware** (High) – As servers reach the end of their maintenance contract, there is the logical push to upgrade to new hardware. Funding is adequate; however, personnel to do these upgrades are limited. Additionally, hardware upgrades can become extremely complex to coordinate due to multiple departments being affected simultaneously. Departments generally do not have the skill sets to implement application upgrades and coordinate user acceptance testing, so these functions in many cases are the responsibility of the database administrators.
5. **Increased requests for SQL Server Express** (Medium) – Some departments have key business functions that are run or could potentially run with a Microsoft SQL Server *Express* backend. Historically, ITS has not supported these databases primarily because of the administrative limitations that SQL Server Express presents even though they may present an immediate opportunity for cost savings.
6. **Increased requests for Microsoft Access Services** (Medium) – Many divisions within departments have key business functions that are controlled by a “home-grown” Microsoft Access Database. As these databases age and the original authors move on, more and more departments are finding a real need to find resources to update and maintain these databases.
7. **Big Data** (Medium) - increasing need for analysis of data by departments to identify trends that otherwise wouldn't be seen. As the custodians of the data, we need to be able to react to requests with tools and techniques.



8. **Open Data (Medium)** - Provide secure data solutions in response to Open Data initiative and government transparency.
9. **Need for Encryption of Sensitive Data at Rest (Low)** – Once data in certain applications is classified as sensitive, the host database servers need to encrypt those databases and database backups.

### On the Horizon Strategic Drivers

1. **Increased frequency of SQL Server releases (High)** – Microsoft is releasing SQL Server versions more frequently. This will result in current version becoming unsupported at a higher frequency.
2. **Technology Change: SQL Server 2014 (Low)** - The next version of SQL Server launched April 1, 2014. There are no funds allocated for the purchase of one development, one test and one enterprise production VM Server to support this effort.

### Short Term Goals (0-6 months) 7/1/15 – 12/31/15

#	Goal/Objective	Est. Start	Est. Duration
1	Complete move off of Windows 2003 Operating System that expires 7/14/2015. This includes some of the SQL 2000 and 2005 databases.	7/15	6 months
2	Develop plan to audit and mitigate any issues found with account security rights.	7/15	12 months
3	Apply SQL Service packs for 2008, 2008 R2, and 2012	7/15	12 months
4	Develop and begin implementation of plan to upgrade SQL Server 2005 (97 databases) which is end of support in April 2016. Capital funding required.	8/15	5 months
5	Complete planned move off of SQL Server 2000 which was end of support in April 2013.	9/15	3 months
6	Investigate technologies available to encrypt all sensitive data at rest. Develop plan to identify sensitive data currently being stored in the Oracle and SQL Server databases not currently secured.	10/15	4 months

### Medium Term Goals (6-18 months) 1/1/16 – 12/31/16

#	Goal/Objective	Est. Start	Est. Duration
1	Continue upgrade plan of SQL Server 2005 which is end of support in April 2016.	1/16	12 months
2	Develop plan for upgrade of SQL 2008 databases to SQL 2012/SQL 2014 (Capital funding required).	1/16	12 months
3	Document and develop support efforts for the increasing requests for SQL Server Express. This will include taking regular backups, running integrity checks, rebuilding indexes, applying SQL Server Service Packs, assisting with permissions, and monitoring.	1/16	8 months
4	Introduce new SQL Server 2014 to the environment (Capital funding required).	1/16	12 months



## Long Term Goals (18-36 months) 1/1/17 - 6/30/18

#	Goal/Objective	Est. Start	Est. Duration
1	Complete move off of SQL Server 2005 which is end of support in April 2016.	1/17	6 months
2	Begin implementation to upgrade SQL 2008 databases to SQL 2012/SQL 2014	1/17	36 months
3	Investigate third party software that will supply additional tools to monitor and troubleshoot SQL Server (Capital funding required).	1/17	12 months
4	Obtain in house knowledge on SQL Server High Availability technologies such as failover, replication, and log shipping.	1/17	36 months

### Related Roadmaps

- Business Solutions
- Land (CityWorks)
- Document Management & Imaging
- iProcurement
- Nashville.gov
- Web Applications

