Role of IT in the Delivery of Rail Service: Insights from Al Short, Chief Information Officer, Washington Metro Area Transit Authority

By Michael J. Keegan

The Washington Metro Area Transit Authority (WMATA) runs the Washington D.C. Metro system, a powerful economic engine for the national capital region, connecting residents in the state of Maryland, the Commonwealth of Virginia, and the District of Columbia to jobs, housing, entertainment, and schools while providing transit service for close to 20 million visitors each year.

In 2018, Metro achieved a milestone with the creation of the Authority's first dedicated capital funding. The capital investments WMATA seeks to undertake in the coming years will focus on improving the safety, reliability, and affordability of its operations. By focusing resources on rebuilding, reforming, and improving Metro, this transit system can adapt and grow to meet the needs of this dynamic region. What role does information technology plan in making this a reality? How is WMATA using technology and innovation to enhance customers experience and improve its operations? Al Short, chief information officer at WMATA, joined me on *The Business of Government Hour* to share his insights on these topics and more. The following is an edited excerpt of our discussion, complemented with additional research.

What is WMATA?

Commonly known as Metro, it was formed in 1967 by a tri-jurisdictional compact between D.C., Maryland, and Virginia (DMV) and an act of Congress. WMATA provides rapid transit service under the Metrorail name, fixed-route bus service under the Metrobus brand, and paratransit service under the MetroAccess brand. The Authority is also part of a public–private partnership that operates the D.C. Circulator bus system. WMATA has its own police force, the Metro Transit Police Department. Today, we run about 1,500 busses and 118 miles of rail across the area. We support the entire DMV area, about a million trips a day between Metro's various modes of transportation, including buses, rail, and metro transit.

How does your office support Metro in meeting its transit missions?

I lead the Information Technology (IT) department for WMATA and report to the executive vice president of Internal Business Operations who reports to the general manager. My organization is responsible for everything from fiberoptic rights-of-way along the railroad to standard enterprise resource planning (ERP) associated with finance, procurement, and HR to the public facing website. Our IT department is involved in supporting the systems that enable the Smart Trip card to maintaining the technology for running our rail system. It is a 24/7 operation, encompasses a gamut of applications, and is made up of about 600-plus professionals between contractors and full-time employees.

What has surprised you most as CIO?

Recently, I was surprised that if you lay out all of the fiber optics we support end to end, we have two million miles of fiber along our rights-of-way. Another example is that the IT organization brings in something on the order of $10-plus million a year in revenue for WMATA through leasing of rights-of-way to various carriers in the area. The rights-of-way across the DMV area is a very valuable resource for the Authority. As we move forward with the

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rapid transit Silver Line phase two, we expect these rights-of-way to be even a greater benefit.

Would you provide a glimpse into things that are challenging?

The breath, size, and scope of our expansive IT portfolio is significant, encompassing infrastructure and operations that help to make the railroad run. Twice a year we inspect every phone along 118 miles of track to make sure that they are operational.

Cybersecurity is another challenge. We must ensure the security of our systems and infrastructure, across many different applications, including mobile and online. We also run internal operational technologies, like Generalized Ordered Track Right Systems (GOTRS) that supports railroad operations. GOTRS helps us make sure the right people

have the right access—and, at the same time, that control room operators know to clear out trains when and where work is being done. It's about safety and security.

Many of the challenges and opportunities we face require IT to continue to make concerted efforts to address current long-term concerns. It also plays an important role in:

- Supporting the acquisition of new technologies
- Recruitment and retention of skilled resources
- Mitigating the risks associated with outdated technology
- Ensuring cybersecurity for ridership, lines of business, and third parties
- Managing a growing pool of data to support state decision makers

How do you lead?

Situational leadership resonates with me. It refers to when the leader or manager of an organization must adjust styles to fit the development level of the followers he is trying to influence. If you are working with somebody who is very accomplished and experienced, then your approach may be more collaborative. Whereas with inexperienced staff, a situational leader may be more direct with them. Along with tailoring your leadership approach, it is also important to surround yourself with those with diverse opinions and experience. They allow you to test your assumptions and provide new perspectives.

Information technology is critical to the success of WMATA. Would you give us an overview of your IT priorities?

Our priorities are safety, customer service, transparency, fiscal responsibility and decision support. My office provides IT and telecommunication services to support these goals. We promote compatibility, integration, and interoperability; and we develop and enforce IT policy and standards throughout the Authority.

To keep pace with trends in transportation and IT, we also need to refresh our technology stack by reinvesting in hardware and software applications. Some of the key drivers are end-of-life and end-of-support, as flagged by our ERP application. We're positioned to continually refresh IT with minimal disruption.

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Important to us today is the emergence of the Internet of Things (IoT). From the standpoint of big data and analytics, we are focusing on how we need to respond to IoT. We are pursuing an enterprise data management (EDM) strategy to establish and institutionalize data quality methods and practices. The goal is to establish models for enterprise data and information flow—turning high quality, accurate and relevant data into information that facilitates a good decision-making process.

Another key focus for us is the data lake enterprise decision support system, as outlined in our Enterprise Decision Support Systems (EDSS) Strategy. Its purpose is to establish a data consolidation platform through enterprise data lake infrastructure—which includes associated data hygiene, data quality, and data governance. Through our systems and sensors, we can collect a wealth of data and then draw inferences in order to make better decisions.

Can you give examples of how improving data management helps you make better decisions?

Twenty years ago, when you installed a fan, all you had was on/off, exhaust, or supply, right? Four bits of information about that fan. You install a fan now it provides you all kinds of data about temperature, RPMs, its overall performance. Multiply this by hundreds of devices with thousands and tens of thousands of sensors. Our task now is to establish an infrastructure capable of processing that data into useful information to support making even smarter decisions.

Another example: we are pursuing a Fare Modernization Strategy. Its goal is to enhance and implement an innovative, easy-to-use, simplistic solution that provides a secure, convenient, ridership-friendly solution over multiple end points. The ridership is always looking for options when it comes to their fare payment choices. Technological innovations and mobile applications render versatile ridership terminals for fare collection and management.

We also see data as a way to attract a strong workforce. We are focusing on building a flexible, secure, resilient, highly available data center—crucial to Metro-IT. We need the best people with the right skills in order to make this IT vision a reality. By enhancing workforce capabilities, we hope to make Metro an "employer of choice."

What does it mean to be a "transit provider of choice"?

That means providing a seamless experience for riders, as far as how they can plan their journey—and it needs to be as flexible as possible. Our mobile app environment gives online users more options, which means we may partner with companies like Lyft and Uber. As a transit provider of choice, we want to support that first mile and last mile, as well.

The Greater Washington Board of Trade is leading a long-term Smart Region Movement to explore, deploy, and expand smart concepts, partnerships, and technologies across our region. Would you tell us more about this effort?

Connected DMV is a smart region, smart cities initiative. It helps communities, governments, and businesses work together to improve how the region runs. Not only is the initiative striving for regionwide collaboration, it is focused on digital technology solutions that boost prosperity and serve the public good. We recently had a meeting with the CIO's Consortium at the Council of Governments. I was there with my peer CIOs from around the DMV region, along with the Office of the Chief Technology Officer for the District of Columbia. I have a very good working relationship with my IT regional colleague. The Board of Trade provided an overview on the initiative. This Connected DMV initiative can only enhance that working relationship within the region. As a regional transit provider, WMATA is a strategic partner in this effort.

What are some of the key characteristics a successful CIO?

Today, the CIO cannot simply be about the technology, you must be a partner with the business, a facilitator of organizational success. It is critical that you add value to the organization—in terms of addressing business needs, enhancing operationally efficiency, improving effectiveness of the organization. You cannot just invest in technology for technology sake. The CIO must always keep the business mission front and center. You are there to provide technology solutions that help solve business problems.

> To learn more about the Washington Metro Area Transit Authority, go to wmata.com.

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