

ITS Strategic Roadmap – FY20 Planning

Wireless Network Infrastructure

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Date last updated: *December 27, 2018*

Background

The Metro Wireless Network Infrastructure is comprised of the communications components that make up and support the reliable wireless transmission of voice and data services. These services are transmitted both within and external to Metro Government facilities throughout Davidson County. The Metro Wireless Network Infrastructure also supports connectivity for outside entities such as the Internet, business partners and third-party entities. These components include routers, switches, wireless devices, firewalls and other gear, which provide wireless services to office spaces, outdoor spaces such as parks and city streets, and other locations.

A recently-completed update improved upon the throughput, stability, scalability, management and footprint of this Metro Wireless network. This process of improvement began at the core of the network and has included all components out to the customer-facing edges.

According to a 2016 study by Gartner, the growth rate for mobile devices entering the enterprise is 20% to 30% annually. Metro ITS now delivers wireless services for Metro employees' use of Metro Government business within select office spaces. As a standard, new or renovated facilities are equipped for wireless capabilities. Departments or agencies in existing Metro facilities without wireless may have wireless installed via capital project request with ITS.

Beyond typical wireless, Metro ITS designed, deployed and supports several wireless internet-of-things (IoT) solutions for agencies including Nashville Fire Department, MNPD and MTA. These projects enable the en route communications and data collection from Metro vehicles and busses. Mobile gateways and networking equipment on Fire and Police vehicles enable these departments to transmit real-time patient information to hospitals, capture safety video from vehicle and body worn cameras and assist in vehicle location and routing for faster response to constituents. Similar technology is being deployed in MTA busses allowing for a broader means of paying fares, tracking locations of busses and prioritizing of traffic lights to assist in maintaining timely bus schedules.

IoT Solutions also have the capability of connecting field workers to critical business operations and applications thus improving efficiencies. Pilot projects are being developed for the Metro Public Works, Metro Parks, Metro Fleet Maintenance and Metro Storm Water. These projects are aimed at providing secure real-time access to asset management systems, GIS mapping services and vehicle telematics.





The Metro ITS department provides free Wi-Fi to Davidson County residents and visitors in over 90 public gathering places. Through the Metro Free Public Wi-Fi initiative, internet connectivity is available at no cost at all public libraries, parks, community centers, and locations where Metro business is conducted such as at the Planning and Development One-stop Shop, the Sonny West Conference



Center, Metro Council Chambers, MTA's central terminal and other sites. Free public wifi services are also provided to riders of MTA's busses to enhance the ride experience.

Moving forward, we will build upon the previous goals of improving reliability with a new emphasis towards increasing services to more agencies, enlarging our geographic coverage area, providing for increased bandwidth and improving our processes to assist in reaching these goals and completing projects efficiently and successfully.

Current Strategic Drivers

1. **Internet of Things (IoT)**  (Game-changing) – IoT pertains to the basic networking of various devices such as a thermostat or weather sensor to allow communication and exchange of data. In the Metro Government environment, current uses include connectivity of vehicles for the management and maintenance activities of those vehicles, emergency vehicle devices such as ambulance medical devices, MNPD vehicles, MTA buses and administrative vehicles, and devices, etc.
2. **Connected Nashville Smarter Cities**  (High) – This driver includes the implementation of new wireless/wired technologies as well as the expansion of existing departmental wireless/wired technologies to assist in the enablement of various Connected Nashville objectives for using data and technology to improve the lives of our citizens. Some examples include data-sharing, public transit, MTA ticketing, Smart Parking and Traffic Signal Optimization.
3. **Recommendations of Metro Broadband Study**  (High) – Metro engaged CNX to study and make recommendations regarding the future of broadband within Metro Government. These recommendations include increasing Metro's owned fiber-network plant.
4. **Customer Need: MNPD Safety Cameras** (High) – This project driver includes sustaining the current infrastructure and an expansion of the existing infrastructure and is intended to provide for additional bandwidth and an increased geographic coverage area as defined by the MNPD.
5. **Bandwidth Requirements** (High) – As Metro department and agency systems become more bandwidth-intensive through increasing use of images, video and Voice over IP (VoIP) telephones, bandwidth must be in place to ensure consistent and reliable wireless service.
6. **Expectation for Ubiquitous Wireless Coverage**  (Medium) – In a world where every fast food restaurant offers free Wi-Fi at some level, there is an expectation among workers and citizens for complete coverage for Metro internal Wi-Fi, along with free public Wi-Fi. These expectations must be applied against available budget and resources.
7. **Challenges in a Growing and Complex Environment** (High) – As the amount of coverage increases, the complexity of the network and its management challenges increases as well.
8. **Metro Facilities Renovations and New Construction** (High) – With the increased growth of Davidson County, updated and new Metro Government facilities are required to services the needs of its constituents.
9. **Customer Needs: Special Events** (Medium) – There are a number of locations that either provide or support special events where wireless network services deliver a key benefit to various entities. Typically, these are events that produce large numbers of users (potentially



thousands) in a limited space for a limited time, which is a different model from typical wireless networking. Examples include the CMA events at the Walk of Fame Park, CVC events at the Walk of Fame Park, and various activities at the Fairgrounds.

On the Horizon Strategic Drivers

1. **New Wireless Technologies (High)** – A host of new wireless technologies are in development and testing currently, not the least of which is 5G, which promises to provide much greater bandwidth than is available today. There is significant activity currently within Nashville by various wireless carriers to bring this technology into production.
2. **Prioritized Cellular Traffic for Public Safety (High)** – A new cellular network is being planned to support a dedicated cellular network to support Public Safety personnel.

Short Term Goals (0-6 months) 7/1/19 – 12/31/19

#	Goal/Objective	Est. Start	Est. Duration
1	Safety cameras – investigation with MNPd to identify the next group of locations that can be fitted with new safety cameras or upgraded from the previous video solutions. Capital funding required.	7/2019	Ongoing
2	Internet of Things – Continue project work with the Nashville Fire Department to identify requirements and develop solutions for their fleet. This includes connectivity from vehicles to medical devices and to outside agencies such as hospitals. Capital funding required.	7/2019	Ongoing
3	Internet of Things – Continue project work with the MTA (WeGo) fleet to identify requirements and develop solutions for customer-based Wi-Fi, vehicle location tracking, fare collection systems, Video and routing systems capable of providing priority traffic signaling to the transit fleet. Capital funding required.	7/2019	Ongoing
4	Evaluate, design and implement wireless system for Nashville Fairgrounds renovation	7/2019	6 months
5	Continue working with General Services to identify the needs of facility renovations and new construction. Capital funding required.	7/2019	Ongoing
6	Evaluate and implement secure wireless network at MNPd facilities to enable the transfer of video from in vehicle video cameras. Capital funding required.	7/2019	6 months



Medium Term Goals (6-18 months) 1/1/20 – 12/31/20

#	Goal/Objective	Est. Start	Est. Duration
1	Services expansion (Wireless) – Increase geographic coverage areas as dictated by customer demand and prioritized by leadership. Capital funding required.	1/2020	Ongoing
2	Services expansion (Cellular) – Implement the results of the FirstNet rollout. This new service will be evaluated in terms of how it can be incorporated into the services that Metro ITS can use to increase and secure our communications for our Public Safety customers.	1/2020	Ongoing
3	EOL – Provide for EOL replacement of wireless network components and upgrades where required. Capital funding required.	12/2020	Ongoing

Long Term Goals (18-36 months) 1/1/21 – 6/30/22

#	Goal/Objective	Est. Start	Est. Duration
1	Market trends and Service provisions – Review of customer demand for various types of wireless services to ensure we are providing the appropriate services at an appropriate cost to our varied customer base.	1/2021	Ongoing
2	5G Services – Take advantage of this next generation wireless service, when it becomes available, as an additional network connectivity medium in support of the many and varied projects planned for Nashville.	1/2021	Ongoing

Related Roadmaps:

- Data Center and Environmental Support
- Network Infrastructure
- Network Security
- Structure Cabling
- Unified Communications

