Title: Citywide In-Building Wireless (C-IBW)

Category: Information Communications Technology (ICT) Innovations

State: District of Columbia – Office of the Chief Technology Officer (OCTO)

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EXECUTIVE SUMMARY

The District of Columbia's Office of the Chief Technology Officer (OCTO) DC-Net program created the Citywide In-Building Wireless Initiative (C-IBW) to positively impact the wireless capability within the District of Columbia. Specifically, C-IBW ensures optimal wireless signal coverage with minimal "dead spots" that inhibit mobile communications. This initiative has gained measured success by creating public-private partnerships that promote technology procurement competition and measurable cost reductions.

PROJECT DESCRIPTION

Concept

OCTO's efforts address the looming public safety concerns and the general frustration caused by inconsistencies in mobile signals and strength. In direct response, C-IBW began offering enhanced wireless services. We recognized that the quality of wireless coverage made District residents, businesses, and visitors more vulnerable to emergencies and crises. This service gap was problematic because 911 access -- via commercial cellular networks -- might be limited or interrupted within District buildings.

OCTO's approach to create a solution that is customer-centric and partner-driven is innovative. While a single-focus approach may be the standard for addressing mobile communication inconsistencies, we realized that the best solutions would be drawn from healthy partnerships. In turn, efforts to implement this initiative were not only driven by our insights. For example, our internal team relied on data interpretations from outside sources. The 911 call enhancements reflected the Federal Communications Commission estimate that, "70 percent of 911 calls are placed from wireless phones, and that percentage is growing." OCTO also gleaned from industry estimates that 50 percent of these wireless 911 calls originated indoors.

Collaboration has greatly augmented our efforts. The District of Columbia has citywide wireless contracts with AT&T, Sprint, T-Mobile, and Verizon Wireless. Our contracts with these wireless carriers have increased our capacity and transferred cost-savings to the District. Consistent with District of Columbia Chief Technology Officer Archana Vemulapalli's vision, OCTO's Citywide Wireless accomplishments ensure that the District is on the "cutting edge of technology" and poised to enhance service delivery for District agencies and residents.

Significance

OCTO's C-IBW addresses two recurring problems within the District's wireless technology capabilities. The first problem addressed is the presence of wireless "dead

spots" throughout Washington, DC. Our solution is to use both on-site and Crowd Testing (Big Data) to identify "dead spots." Once these locations are systematically highlighted and verified, our team collaborates with the government and wireless carriers to find the best ways to eliminate them. Since our solution is data-driven, results can be targeted and ultimately more cost-effective.
C-IBW also remedies the problem of coverage deficiencies in District buildings.

Our innovation also addresses the carrier-related problem. Typically a Distributed Antenna System (DAS) is installed that provides coverage from a singular carrier. This solution is not a good fit for all buildings and does not generate healthy competition, which can drive down client costs. Business processes, financial requirements, and technical reasons are additional factors that make this standard approach for coverage deficiencies ineffective. C-IBW's use of a neutral-host platform ensures that building tenants are not stuck with high-cost, poor-quality wireless services.

Impact

C-IBW has been the gateway for the District to address resident, business, and visitor interests in many ways. For example, the 311 toll-free number places a suite of District services within the reach of a mobile device. This innovation improves service access to our residents, workers, and visitors. Another example of our trailblazing efforts is noted in the District's Health and Human Services Department of Behavioral Health "Mobile Crises Services" delivery. Our in-field technology supports clinicians; our first-responders; and adults who experience psychiatric crises but are unable or unwilling to travel to traditional mental health service sites. The tangible impact of C-IBW has also proven itself in the District's fire station services delivery. Since the initiative's inception, stations have received wireless upgrades that allow end users to accept mobile calls. C-IBW's WiFi leverage ensures that essential and bandwidth-intensive information is easily accessed without the burden-of-usage charges.

CIBW Initiative receives $2 million per year from the District's Department of General Services. C-IBW's smart use of the power of technology has greatly improved wireless capability access to residents, businesses, and the government by offering strengthened wireless services. Specific achievements include a cumulative return of $1.40 for each $1 of capital invested in this effort; this figure exceeds the business plan goal of $1.05. The District of Columbia Public Schools system is yet another example of C-IBW's success. To date, nearly 5,000 wireless access points have been deployed within the District's 109 public schools. Finally, benefits have been realized via the installation of the Distributed Antenna System (DAS). This design and type of in-building system has been deployed at an average capital cost of $143K per system. Our costs clearly outpace private sector DAS system costs, which average $314K - $500K.

Technology solutions that impact will always cause subtle and obvious shifts in operation and behavior. C-IBW is no different. Resource distribution, operational changes, and paradigm shifts occurred during this time of transition. Despite the inherent discomfort, we understand that the effectiveness of disruption is always measured by the overall efficiency and cost. The C-IBW project continues to meet these criteria.

To the District's credit, our enhanced wireless capabilities in the District almost go unnoticed; residents and visitors seamlessly enjoy strong outside and in-building connections in professional and public environments. Prior to C-IBW, District buildings experienced limited wireless carrier options. Mobile service was characterized by weak signal strengths, intermittent access, and dropped calls. These end-user issues were amplified by contracts with inflexible rates and options. Our innovative solution introduced the District to the benefits of a level playing field. Smart alliances with private sector partners created healthy competition among mobile service carriers. We now have an unprecedented ability to offer building management optimal service at affordable rates. Moreover, these clients now have ongoing flexibility to switch carriers

based on their changing connection, budget, and program delivery needs. Disruptive by nature, the results continue to create a safer, more enjoyable city.

We have innovated on top of a District-wide wireless system that was not agile and offered residents, businesses, and visitors intermittent access. Our re-use of existing, traditional infrastructure has improved service delivery and business opportunities within the District's ecosystem. Our repurposing has been seamless because of the intentional documentation of C-IBW structures and processes. As an example, capturing mission-critical information has made it easy for C-IBW team to easily identify areas of inadequate coverage and repurpose aspects of the existing system. This clear layout of concrete data allows for future project re-envisioning and scalability by diverse target audiences. Our robust documentation also ensures these modifications can be made independent of project team changes.

C-IBW's unqualified dedication to information technology inclusion aligns with NASCIO State IT Recognition Awards mission. These qualifications make the C-IBW innovation an ideal award recipient.