Fort Lauderdale Tracks Building Permits

The city monitors the flow of documents, saving time and improving customer service. By Barb Freda

WHEN MARK LEIBOWITZ began working as a management analyst in 2014 at Fort Lauderdale's Building Services division, part of the Department of Sustainable Development (DSD), he saw reams of paper moving through the system. During any given month, DSD issues more than 2,000 permits and conducts more than 6,000 permit application reviews. Permits for large plans often have two copies, he says. The permits, he

Mark Leibowitz.

adds, do not move in a straight line through the approval process. Files are pulled for additional review or revisions, sometimes several times as they proceed through the pipeline.

Depending on the type of permit, Leibowitz says, an application may need to be reviewed by employees in 10 different disciplines within DSD. And, he notes, each discipline has several reviewers, which can make it challenging to track the physical location of each permit application in a timely manner.
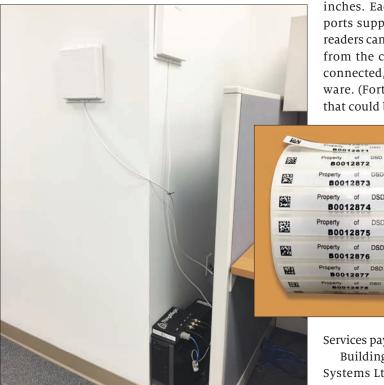
"I knew it would be a while before we went paperless, so one of my first projects was to find a more efficient way to track plans, applications, backups and documentation," Leibowitz says. "The building official and I saw an opportunity to improve the permit-tracking process to make it easier to locate a specific permit application—which, in turn, would increase our operational efficiency and improve customer satisfaction."

Leibowitz figured the security tags on clothing that sounded an alarm if they weren't removed before passing through a store's exit involved some tracking, so he researched the use of security tags at department stores. "That was when I learned that those security systems used RFID," Leibowitz says. "I was able to conduct a more focused search about how RFID might work for us. Then, I had a conversation with a colleague in our IT department, describing what I wanted, and that person told me that our fire department was using something similar to track inventory."

"I called them and went to look at it," Leibowitz says, adding he had a great guide who explained how the system worked. "They tracked every vial, every syringe and air tank, everything. I knew we could put those tags on files." (It's similar to the solution deployed by South Metro Fire Rescue Authority; see RFID Saves an EMS With Inventory Challenges.)

Leibowitz contacted Silent Partner Technologies (SPT), which developed the fire department's RFID solution. He liked that company's ideas, but had to follow protocol and request two additional bids from other RFID providers. SPT won the bid based on price and responsiveness to the request, he says.

It took roughly one month for SPT to install and implement the file-tracking solution. Building Services began RFID-tracking permits and other documents in December 2015.

The readers can see tags located up to approximately 20 feet from the chokepoints. Inset: Each RFID tag is printed and pre-encoded with a unique identification number.

inches. Each reader has three reverse TNC antenna ports supporting monostatic 50 Ohm antennas. The readers can see tags located up to approximately 20 feet from the chokepoints, Kostis says. Each device was connected, via USB, to a PC that runs the SPT middleware. (Fort Lauderdale found seven PCs in inventory that could be dedicated to the project.) The computers use an existing Ethernet connection to transfer data to the cloud.

The files were identified with Avery Dennison's adhesive-backed UHF tags, which contain an Impinj Monza R6 chip. Each tag is printed and pre-encoded with a unique identification number and can carry out more than five million transactions. The tags come on a roll, and Building Services pays 14 cents per tag.

Building Services also purchased three Convergence Systems Ltd. CS101 handheld UHF RFID readers. The handhelds have a read range of roughly 26 feet and a read rate of 400 tags per second, Kostis says. The readers operate like a Geiger counter, zeroing in with a visual and with an audible sound as a user approaches a tagged document.

THE SOLUTION

In September 2015, Leibowitz formed a cross-functional team that included Silent Partner Technologies president Ted Kostis, two SPT colleagues, and a senior technology strategist from the City of Fort Lauderdale's IT department. The team mapped out the flow of documents, identifying seven places within the building through which all files must pass.

"We walked around the building," Leibowitz says. "I explained how the documents traveled and all the places they could be, and we identified specific zones, knowing that if we put the readers in those spots, there would be no way they would not pick up the tags. Once we agreed on those zones, we knew we could identify a trail."

At each chokepoint, SPT mounted one to three L-Com HyperLink 900 MHz 8 dBi circular-polarized flat-patch antennas on the wall, then connected those to a nearby ThingMagic Vega reader via coax cable. The Vega reader, which has an M5e ultrahigh-frequency RFID module, measures 8.5 inches by 5.25 inches by 1.5

THE PROCESS

As someone creates a hardcopy file for a permit, that person peels a tag from the roll and affixes it to the document. The same individual then uses a handheld bar-code scanner, which is connected to a PC via USB, to read the printed bar code on the RFID tag. This process associates the file with the bar code and the tag's ID, and enters that data into SPT's IntelliView cloud-based software, which includes middleware to manage tag reads and an inventory-management application.

When the tagged files pass any of the seven chokepoints, the online data is updated in real time. Authorized users can access the information from any device with an internet connection, using any browser at any time. Building Services' administrative support staff represent the primary users of the RFID system, Leibowitz says, though plans examiners have been known to use the system from time to time as well.

The system is "extremely user-friendly," Leibowitz says. Silent Partners made sure they "trained the

trainer," he states, adding, "SPT was great about helping us troubleshoot and get comfortable with the system until it was officially launched. Fernando Ayrosa, a senior technology strategist with the city, and I coordinated internal staff training." Arvin Quintana, one of the first people trained to use the handheld reader, has been nicknamed the "Perminator" for his ability to use the RFID system to locate permits quickly, Leibowitz says.

"At first, I was primarily concerned with focusing on the seven zones throughout the building and reducing the

search area," Leibowitz recalls. "The zones intersect, so there are no dead spots. Once we know which zone a permit is in, we can use deductive reasoning to locate the permit itself. The portable readers were supposed to be used in case Plan A (using the online system) took too long. Once the plan was set into motion, we quickly realized that the portable readers were the most efficient way to locate a permit." The handhelds, all fondly named "Flo" by the Building Services users (after Progressive Insurance's reader-happy commercial spokesperson), are what users turn to most often to locate a document.

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"You could just look at the system and see where a file was last, then walk around and look for it," Leibowitz explains, "but the gun [the portable reader] makes it go faster. You go to the online system and get the tag number of the document you are looking for, and where it was last recorded. You type that tag number into the gun, hit 'go' and move the gun around the area where it was seen last. When it gets close, it beeps really loud, and there it is. Some people use the gun without even knowing the last location. They get the tag number, type it in and go looking for the permit." The handheld cannot read through 20 files stacked one on top of another, he notes, but the quick solution to that was to fan out a stack of files.

THE BENEFITS

Building Services has been using the RFID solution for one year, but the benefits came much sooner, Leibowitz reports. "We started noticing the return on investment right away," he says, because many staff labor hours were dedicated to the work itself and not to locating the files. "We were able to improve efficiencies and really improve our customer service. Here, at the City of Fort Lauderdale, we call our customers our neighbors. We are giving them better customer experience and quicker status updates because we can find their documents faster." The total cost of getting up and running, he says, was less than $25,000.

The software can generate a number of reports, Leibowitz says, but the staff is still learning how to take full advantage of that feature. "The transaction history can be very useful—it says where an asset was first, then second, etc., and when," he says. "Sometimes, we do get questions where that information is important to know, but we just don't use those reports that often." Knowing where the documents are located in real time, he adds, is what matters most right now.

Now, Building Services plans to begin using RFID to track computers and laptops. "The amount of permits we are processing has grown significantly since the economic recovery, which has necessitated the hiring of more staff to meet the increasing demand," Leibowitz says. "This means we have more people handling more permits, and it made good business sense to implement a more efficient system. Given the success of the RFID technology in tracking permits, staff is supportive of expanding the use of the technology to increase efficiencies elsewhere."

"For us, using this tracking is exciting," Leibowitz states. "I have heard of it used in evidence rooms, in inventory and security, but never to follow documents through a system, so we are all excited that it is working for us and proving to be so efficient. We [Leibowitz and the building official] have already given a few presentations about our application to the Greater Fort Lauderdale Alliance, and people's eyes light up. This can translate into a lot of different ways and places, saving time, money and resources." Best of all, he adds, it was easy to implement. ◻