A Collaborative Approach to Storm Recovery

Iberdrola USA Companies Use Esri Maps, Collector, and Dashboard to Get Power on More Efficiently

By Sarah Alban, Esri

Iberdrola USA companies New York State Electric & Gas (NYSEG) and Rochester Gas and Electric (RG&E) serve nearly three million electricity and natural gas customers in upstate New York. In the after-event review of Superstorm Sandy response, the Iberdrola USA companies saw an opportunity to improve data gathering for response planning. What started as hurricane response improvement plans transformed into an all-events, cost-effective damage assessment strategy, achieved through a partnership between Iberdrola USA and Esri. Before we get to the solution, we need to begin where the issue started: Superstorm Sandy.

On October 29, 2012, Superstorm Sandy□—□a monster hurricane packing torrential downpours and 80-mile-per-hour winds□—□roared into the Northeast U.S. With damages totaling $65 billion, Superstorm Sandy is thus far the second most destructive hurricane in US history behind Hurricane Katrina that caused $108 billion of damage along the Gulf Coast in 2005.

While Long Island and New York City bore the brunt of the damage from wind, rain and storm surge, more than 117,000 NYSEG customers and 27,000 RG&E customers were without power.

As a result of Superstorm Sandy, New York Governor Andrew Cuomo created a Moreland Commission, tasked with making recommendations for improvement during extended power interruptions. One Moreland Commission outcome was the

development of a utility “scorecard” to be filed with the New York State Public Service Commission. The scorecard is essentially a report on a number of key performance indicators for outage events lasting 72 hours or longer. One essential measure of performance is timely preliminary damage assessment. Both to improve event response and to comply with scorecard reporting, Iberdrola USA sought an automated central repository of damage assessment information that would offer a more efficient approach.

Pre-Sandy Storm Response

The Iberdrola USA companies□—□including Central Maine Power□—□had already begun enhancements to restoration processes, particularly focused on damage assessment. Here’s some history. In 2005, Iberdrola USA damage assessors relied on paper tally sheets and maps in the field. During an event, in the overnight hours, office staff compiled and entered the assessors’ findings.

That process improved in 2006, when Iberdrola USA got palmtop computers (PDAs) which ran a customized version of Esri's ArcPad. By 2012, the maps were semi-automated and could get into the geodatabase a bit quicker. But the process was still manual, as office staff still had to collate the data after collection. As with most technology, the 2006-era AT&T PDAs became rare in 2013, even on eBay. Before a storm, Stepehn Hope, NYSEG's GIS and mapping project manager, packed the devices and drove them, sometimes through threatening conditions, to affected locations for fast deployment. When the utility determined to decentralize the devices, they determined that at least 200 additional PDAs would be required.

"There was no way I was going to be able to find that quantity," Hope said. "In addition, I was looking for an opportunity to address the manual processes associated with the existing devices□—□in particular, the after-hours data entry." Partnering with Hope on finding a technological solution to damage assessment was La Wanda Ervin,

electric distribution QA/QC manager, who brought years of electric field engineering and operations experience supervising damage assessors in the field and compiling the data to develop restoration plans.

And then there were the municipalities and counties themselves. They were engaged in the post-Superstorm Sandy discussions and wanted to be part of the solution.

Municipalities had begun to look for ways they could leverage their resources to assist with the labor-intensive process of damage assessment, particularly in areas that had a lot of ground to cover. Superstorm Sandy made the need for collaboration even more apparent. Due to the sheer destruction on secondary roads, utility workers were unable to access their equipment to complete even a preliminary assessment of broken poles, downed wires or damage transformers.

The municipalities asked if there was a way their workers could report damage to the Iberdrola USA companies, rather than waiting for company damage assessors to get to their areas. Municipalities wanted to be able to input a downed pole or blocked road, for instance, with coordinates, pictures, and details into NYSEG's database.

The Iberdrola USA companies thought this was a good idea. IT applications manager Paul Booker and programmers Dean Hartley and Dick Abram worked with ArcGIS Online to make the idea a reality.

"We owe a lot of the success of the project to the developers," Hope said.

The project also fell in line with one of the Moreland Commission's recommendations that utilities collaborate more with municipalities.

Post Sandy Collaboration

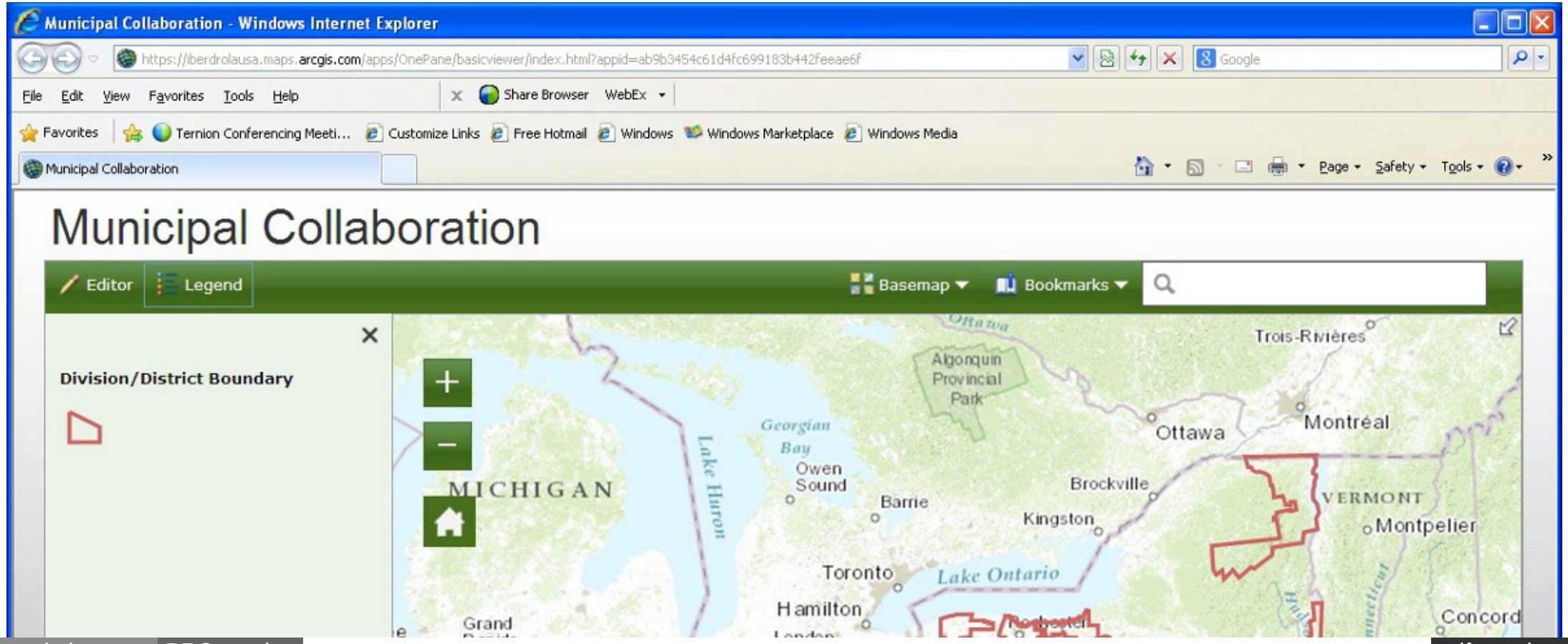
With guidance from Esri, the Iberdrola USA companies sought a solution that fit its licensing and could be deployed within the year. “After talking with Esri, I knew what we could do quickly and easily,” Hope said.

On November 3, 2014, the Iberdrola USA companies deployed a three-part GIS solution for damage assessment: one part municipal collaboration through web maps, one part mobile damage assessment with Iberdrola USA damage assessors, and one part dashboard-based office supervision.

Part One: Municipal Collaboration with Web Maps

With the new technology, a municipal worker can call their dispatcher to report preliminary damage (such as a broken pole or blocked road),

who logs in to the web map and records the damage. This simple approach allows for an easy, damage-recording interface between municipalities and the utility□—□and also requires minimal training for municipal personnel. The municipality has to have an ArcGIS Online named user account to participate.

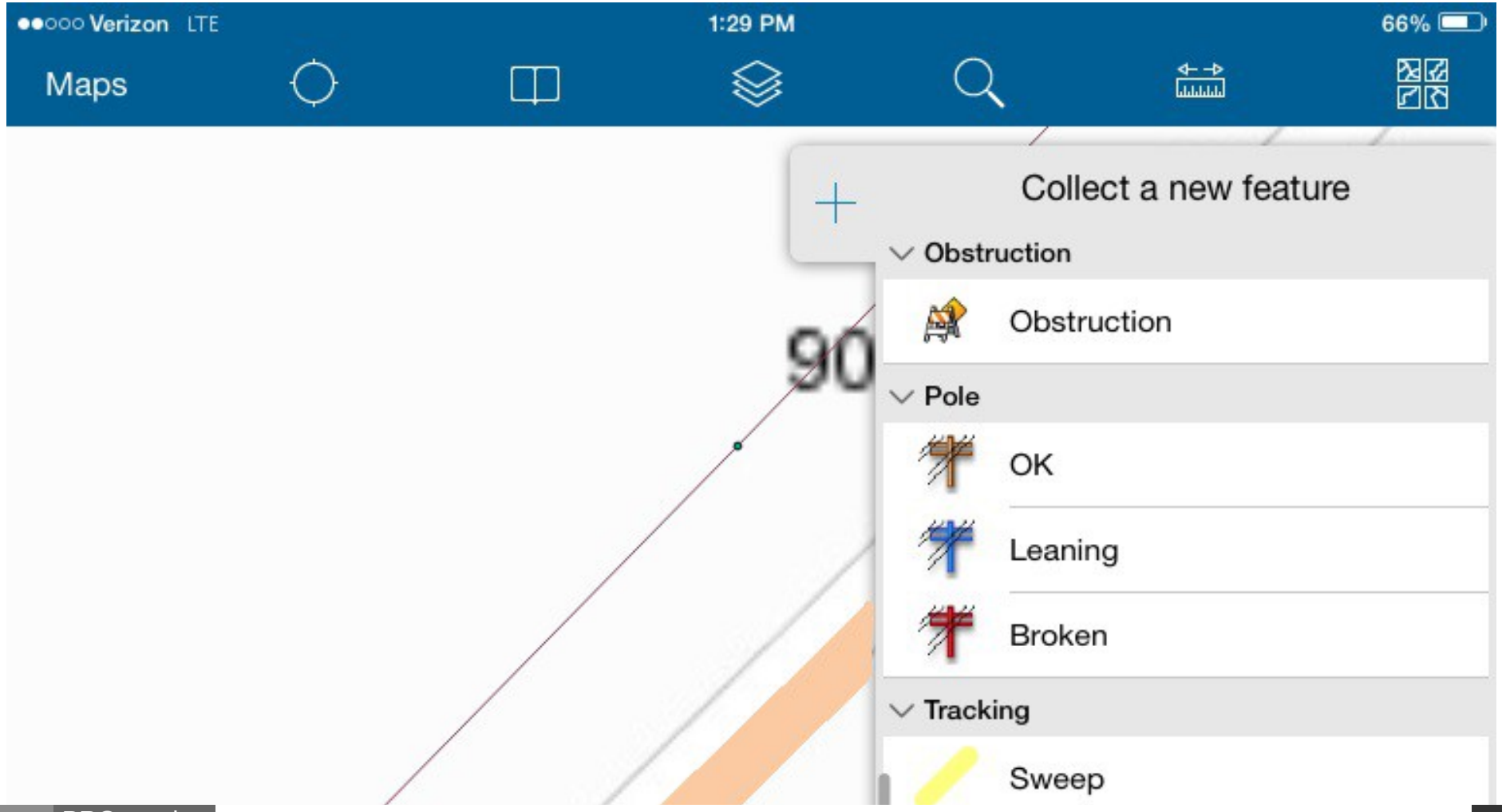


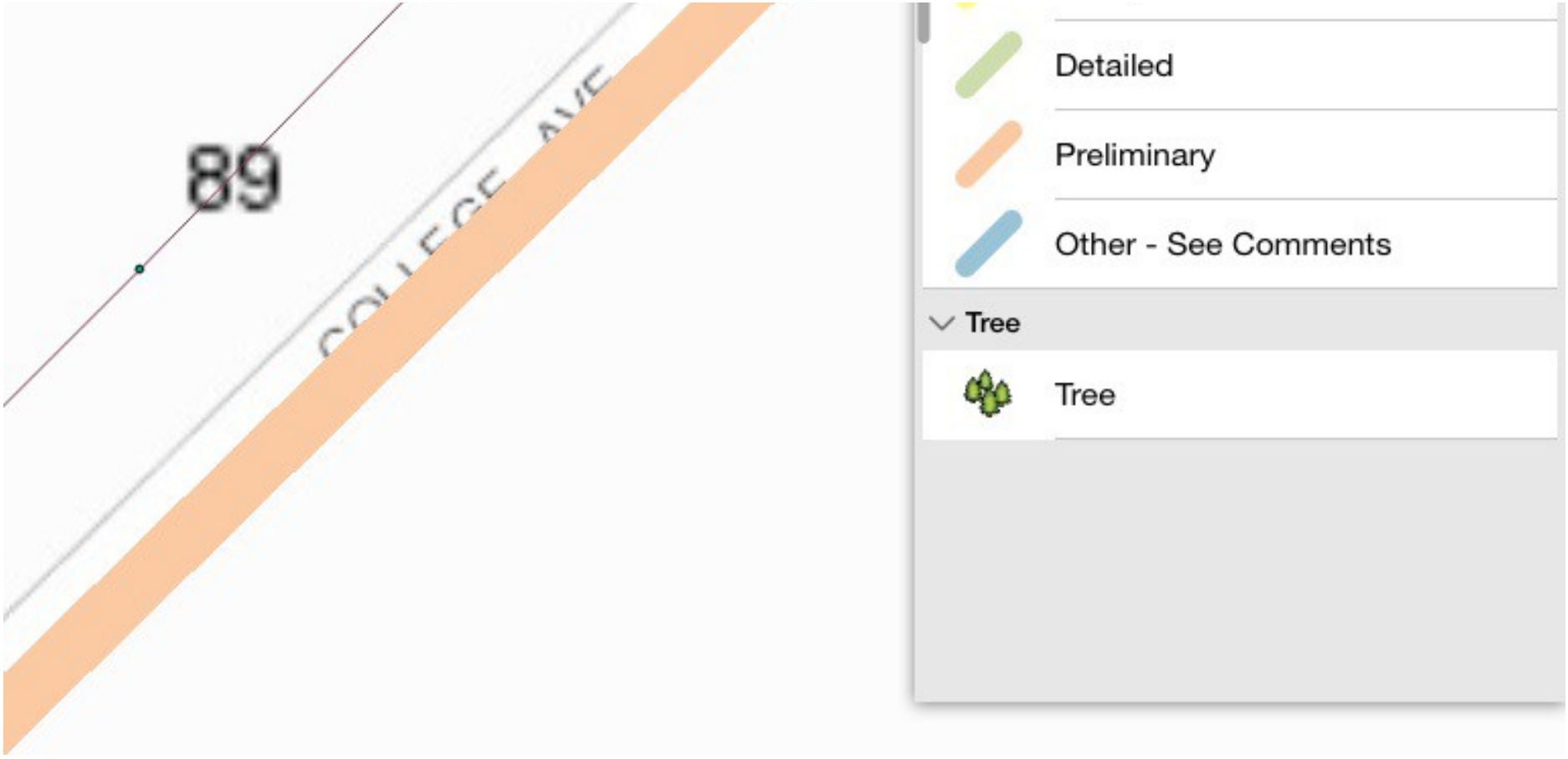
NYSEG piloted this approach to three municipalities. Iberdrola USA hopes more of the nearly 1,000 municipalities in its two-state service area join in this initiative.

Part Two: Mobile Damage Assessment

Meanwhile, in addition to working with municipalities, Hope, Ervin and the team were addressing ways to improve the Iberdrola USA companies' damage assessor tools. As a result of their work with Esri,

Iberdrola USA launched the Collector for ArcGIS app. The utility negotiated a contract with Verizon for 300 iPad minis with data plans and individual phone numbers. Hope and Ervin distributed these evenly across the company's New York and Maine service areas, so damage assessors can be deployed quickly wherever a storm hits.





Assessors can report damaged assets with increased accuracy in real time, thanks to online and offline editing modes that talk to the geodatabase as soon as they enter cell service. A big benefit of the move from PDAs to tablets having map-based data collection.

“We did not use maps on the PDAs because the screen was so small,”

Hope said. “With the tablets, the maps are large and easy to use.”

Field workers can directly enter damage data as the tablet’s GPS autopans to that location. They can drop pinpoints to mark damage, and the back-office programming automatically assigns the associated pole ID information by drawing from the nearest pole. Assessors can then communicate to and from the field with email or texting. They can input photos, damage extent and type, and nearby conditions.

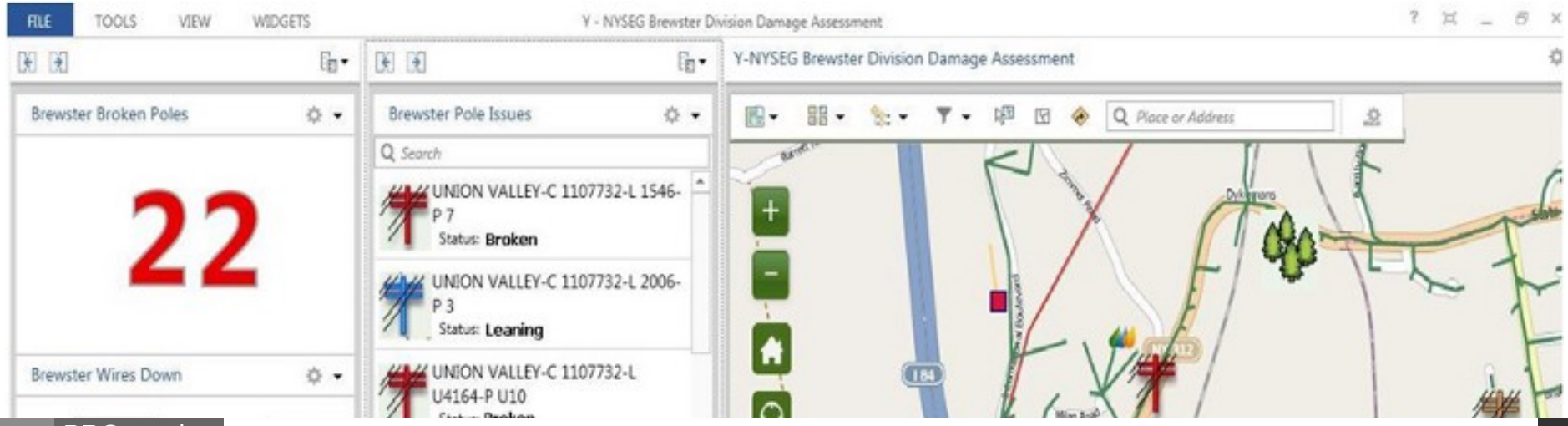
The more efficient system and user-friendly environment saves time and money, and the field workers have offered extremely positive feedback.

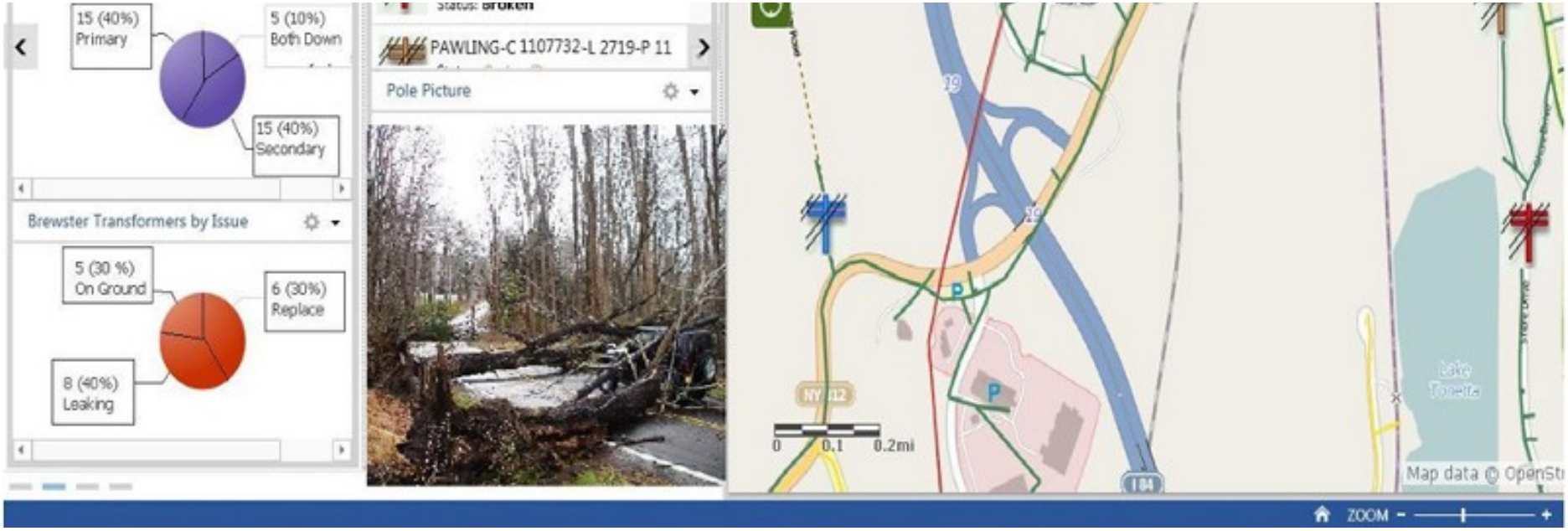
“The feedback we received has been wonderful,” Ervin said. “The data coming in is more accurate, and most of our field technicians already used iPhones, so the technology is familiar to them. They love it.”

Part Three: Operations Monitoring Web Application

Supervisors at the Iberdrola USA companies monitor this information on an in-house, Esri-based web application to monitor the field. No more waiting a full day to get the data to compile overnight.

Meanwhile, event leaders now have a higher-level dashboard view available through ArcGIS Online that summarizes information, including downed primary and secondary wires, where transformers are leaking or needing replacement and broken pole tallies.





"Training was minimal for Collector, web maps hosted on ArcGIS Online, and the utility's dashboard because the interface is simple, intuitive, and very easy to teach," Hope said.

The Iberdrola USA companies are very satisfied with their Esri solution because it met their criteria☐—☐a quickly implemented project that provides real time damage assessment entry, municipal involvement and dashboard view for overall situational awareness. There's one more benefit☐—☐it was exceedingly cost effective☐—☐less than $100,000

to implement, including the initial cost of licensing, devices, and other equipment. As Ervin pointed out, costs of power restoration are more than monetary.

"Imagine the costs savings in a storm like Sandy if you can leverage technology to get the power on one day faster," she said, "The payoff is also increased customer satisfaction and improved municipal relations."