Storm Response that WERCS

Lane County, Oregon, Clears Roads Faster, More Safely with Utility Collaboration on GIS

By Sarah Alban, Esri

Precipitation in Lane County, Oregon, reaches 65 to 90 inches per year. Geographically situated on the west side of Oregon, midway down the state coast, Lane County covers 4,620 square miles of territory that spans coastline to the Cascade Mountains.

In February 2014, a severe multi-day storm hit Lane County, bringing snow followed by wind and freezing rain, in turn bringing down trees and power lines. Roads needed clearing, especially for emergency vehicles.

County road crews needed to be able to quickly assess and prioritize roads for clearing. As a normal course of operations, whenever there is a downed power line entangled with a downed tree, they need to know that the power line has been cleared and that it's safe to remove the tree. A decades old problem resurfaced during the February storm□

—□public works crews had difficulty getting power line status updates from utilities because of the sheer volume of lines down. Traditional means of communicating weren't effective and in some cases, communications were completely unavailable due to the remote location of the incident.

"There was so much going on, and all the phone lines were usually busy, we couldn't get through," GIS Program Manager Melissa Crane said.

What the Storm Coordinator had were paper notebooks□—□one per each of Lane County's five road maintenance zones. There, they could jot down incidents and locations of roads that needed clearing. But the county needed a better way to communicate with utilities.

Impassable Roads

25 Richardson Park Road MP 0.50
Powerlines and trees blocking all lanes
ETA: 9am

28 N Fork Siuslaw Rd MP 5.50
3 Large Tress blocking both lanes
ETA: 1pm

29 MCKENZIE VIEW DR MP 1.00
Powerlines and trees blocking all lanes
ETA: In work

30 Mckenzie View Drive MP 2.75
Large Tress blocking all lanes
ETA: 5am

30 Minute Updates

25 Richardson Park Road MP 0.50
Powerlines and trees blocking all lanes
ETA: 9am

52 HILL RD MP 2.75

ETA: In work

29 MCKENZIE VIEW DR MP 1.00
Powerlines and trees blocking all lanes
ETA: In work

Selected Events

29 MCKENZIE VIEW DR MP 1.00 Utility / Tree Damage
Closest Place: 33   Mckenzie View
Location Notes:
South of Coburg Rd
Operation Notes:
Powerlines and trees blocking all lanes
Open Lanes: 0
Maint. Zone: 1
Trees - Count: Size: Type:
UtilityHazard Type: Down Line
ETA: In work ETC:
Last Edited: April 2, 2015

30 Mckenzie View Drive MP 2.75 Tree
Closest Place:
Location Notes:
Northwest of Hill Rd
Operation Notes:
Large Tress blocking all lanes
Open Lanes: 0
Maint. Zone: 1 Northwest of Hill Dr
Trees - Count: 3 Size: 25" dia 30 ft tall Type:
Evergreen
UtilityHazard Type:

Help Files

[Operations Dashboard Guide](#)
[Excel Spreadsheet Template](#)

WERCS Map - Test

ZOOM

Events Table

| OBJECTID	Event Type / Road Status	HazardType	Utility Hazard Type	Road Name	Closest Address / Intersection	Location Notes
25	Utility / Tree - Impassable Road	Utility / Tree Damage	Down Line	Richardson Park Road	Clear Lake Rd	Tree taken care of by county and
26	Tree - Road Clear	Tree		Clear Lake Road	Shady Lane Road	North of Dunes City
27	Tree - Restricted Travel	Tree		Munsell Lake Rd	31st St	Near Golf Course
28	Tree - Impassable Road	Tree		N Fork Siuslaw Rd	Portage Way	North East of Florence
29	Utility / Tree - Impassable Road	Utility / Tree Damage	Down Line	MCKENZIE VIEW DR	33 Mckenzie View	South of Coburg Rd
30	Tree - Impassable Road	Tree		Mckenzie View Drive		Northwest of Hill Rd
31	Tree - Restricted Travel	Tree		High Prairie Rd	Dead Mountain Rd	Northeast of Westfir, No Alterna

In August 2014, Lane County's Public Works Department conducted a needs assessment internally, to determine a better solution for post-event collaboration and road restoration. They developed a proto-type for a real-time, spatial solution to their needs.

Real-Time Weather Response

Lane County built the Weather Event Response Coordination System (WERCS), a series of solutions running off the Esri platform. WERCS uses ArcGIS Online, ArcGIS for Server (to protect data and applications in the case of an on premise emergency), the Collector for ArcGIS app, and Operations Dashboard for ArcGIS to foster near-real-time, inter-agency knowledge during and after storm events.

"The biggest need was the ability to have people in the office and in the field update the incident□—□either add an incident or update a status," Crane said. "That was the key requirement that led us down the path toward Collector."
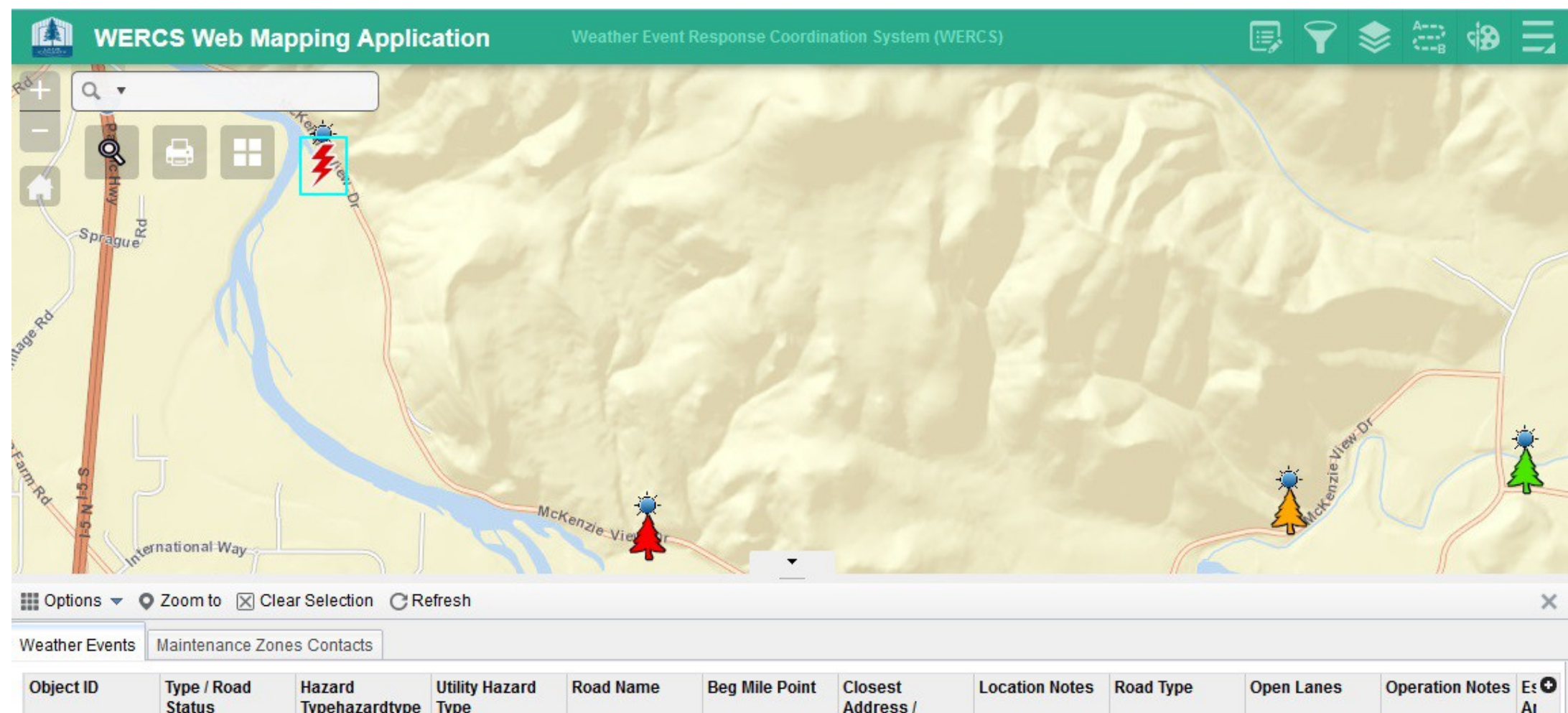
28	Tree - Impassable Road	Tree		N Fork Siuslaw Rd	5.5	Portage Way	North East of Florence	Collector	0	3 Large Tress blocking both lanes	1p
29	Utility / Tree - Impassable Road	Utility / Tree Damage	Down Line	MCKENZIE VIEW DR	1	33579 Mckenzie View	South of Coburg Rd	Collector	0	Powerlines and trees blocking all lanes	In
30	Tree - Impassable	Tree		Mckenzie View Drive	2.75		Northwest of Hill Rd	Collector	0	Large Tress blocking all	5a

A web application gives coordinators a tabular and spatial view of active road statuses.

Public Works dispatchers use a web application to enter emergency events, like downed trees, flooded roads, or fallen power lines, to a web map hosted in ArcGIS Online. Collector routes field crews to the problem, where they assess the situation and update repair statuses.

Mootz also created a Python script that checks ArcGIS Online every five minutes for new or updated event statuses. Collector pushes these updates to coordinators responsible for allocating field resources. The process eliminates the need for manual status updates and gets rid of the Storm Coordinators' notebooks, which they had used to jot down
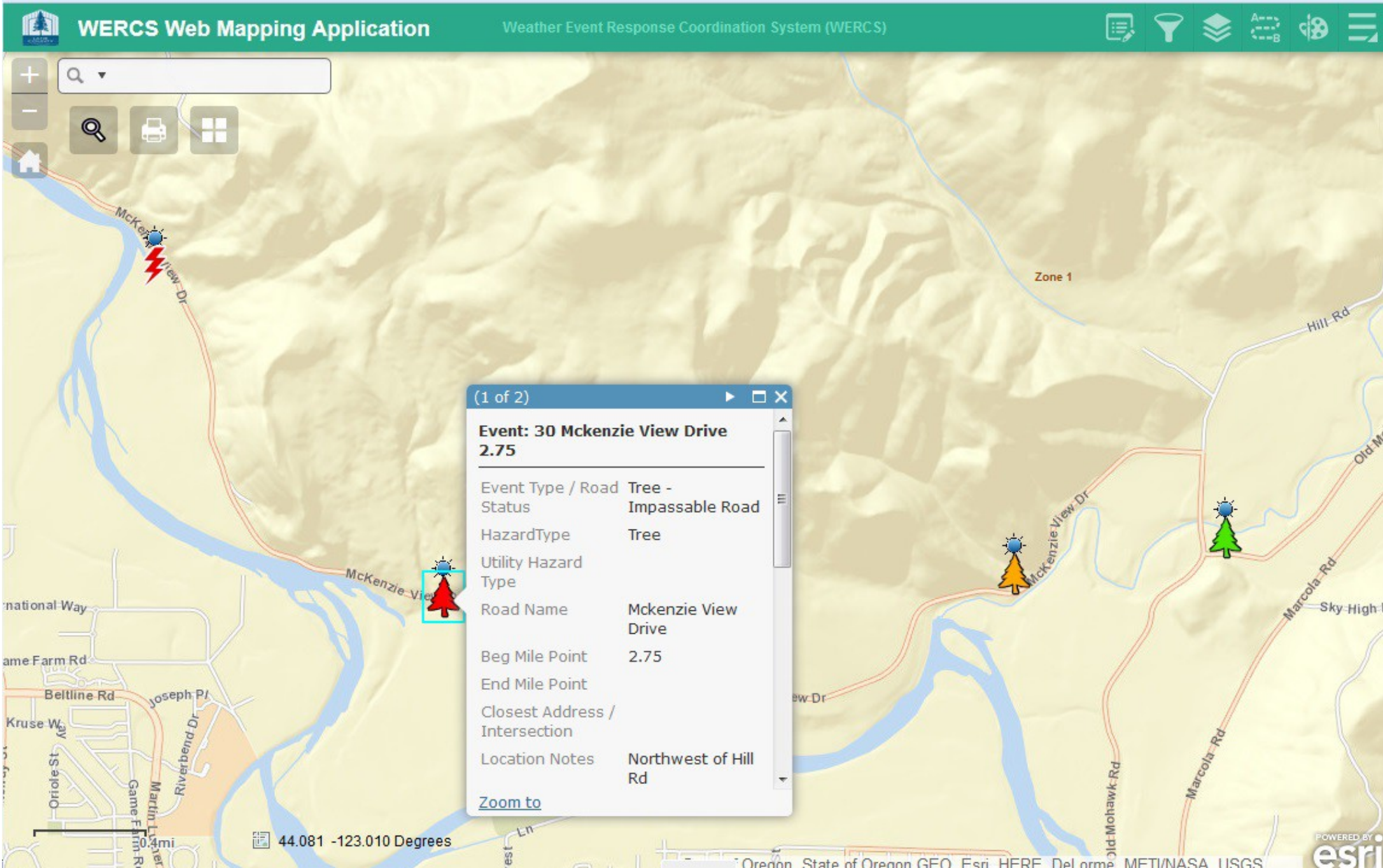
incidents and repair statuses.

"Real-time access was the big seller here," Mootz said.

Meanwhile, they can check from the field if the county is responsible for clearing a road or not.

"This application would give them a way of looking that up in the field, so they have confirmation as to whether or not they should be working on that road," Crane said.

In the office, Public Works management can access an operations dashboard for a list of all events that have been updated in the past 30 minutes, as well as high-priority items. Staff can also copy the full list of event updates from the dashboard into Excel to share with the county's public information officer.

Weather Event Response Coordination System (WERCS)

Zone 1

(1 of 2)

Event: 30 Mckenzie View Drive 2.75

Event Type / Road Status	Tree - Impassable Road
HazardType	Tree
Utility Hazard Type	
Road Name	Mckenzie View Drive
Beg Mile Point	2.75
End Mile Point	
Closest Address / Intersection	
Location Notes	Northwest of Hill Rd

Zoom to

44.081 -123.010 Degrees

Oregon, State of Oregon GEO, Esri, HERE, DeLorme, METI/NASA, USGS

POWERED BY esri

To please stakeholders who wanted the application up and running quickly, Crane's team used Web AppBuilder to build out WERCS.

"Our stakeholders wanted something by October after our August meeting," Mootz said. "With the Web AppBuilder we were able to get something up quickly and show this is what we can do, get feedback from stakeholders, and by October we had basic functionality in place, except for tweaks. In a few weeks, we had it up and running."

Public Works Tests WERCS

Crane and her staff trained Public Works crews on using the iPad application.

"They just love it, I'll tell you that much," Mootz said. "They're excited to get rid of those paper notebooks for sure."

Lane County is also pilot testing WERCS with one utility before finalizing the concept and design stage. After the prototype has been accepted by both public works and the utility, the application design will be finalized and County GIS developers will complete a release build for rolling out to all utilities in Lane County, with an estimated fifty total users□—□including field crews, dispatchers, the Public Works Department, and utilities. The target roll out date is dependent on a small grant award ($20,000) being funded. Once funding comes through the roll out date will be set.

"It's safe to say this will improve efficiency, response time, as well as communication between various county groups, the county and its citizens, and the county and the utility companies," Crane said.

Feedback has been positive, and stakeholders are asking for more functionality, including a public-facing web map to let citizens upload photos to the application.
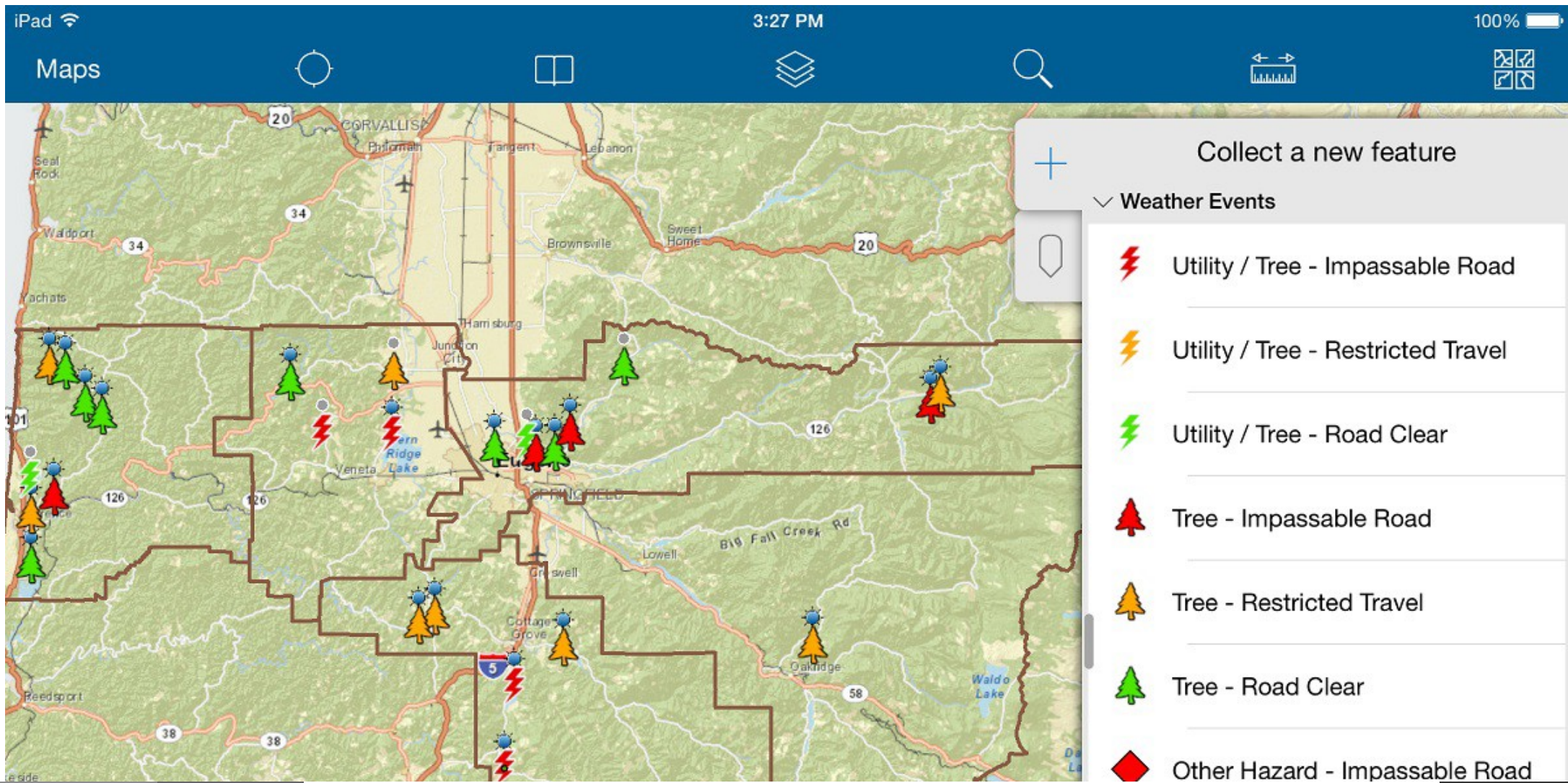
Response crews input and update road hazards from the field by using the Collector for ArcGIS app.

Field crew supervisors are even testing the technology for every-day activities, such as culvert cleaning, vegetation management, and other non-weather issues that impact roads, including road kill.

"This gives the field crews a lot of information they use in daily operations," Mootz said. "Currently they carry paper mapbooks, so this could replace or reduce the use of those. It's much easier for them to get

the information they need when they're out in the field searching for addresses or a particular road."

Crane sees the GIS team, which has been growing to serve the whole county and some smaller counties and cities, with a toolbox of solutions that can be adapted to meet new business needs.

"My main goal is to provide people with the tools that make their jobs easier, to give them the information they need, and to have a one-stop shop for a particular business function, so they don't have to look at multiple applications," Crane said. "We're really trying to pull in data into one system so it's all right there at their fingertips. That's my overall vision."

Esri on May 28 · 5 min

NEXT STOP