

Envisioning for Electric
ArcGIS Reveals Hidden Hazards - Safety First
Bill Meehan, Pat Hohl and Greg Hunt



Outside 1 - Title
Center 1 - Title



Outside 2 - The five pillars
Center 2 - Simplified safety poster

FADE IN

NARRATOR

Welcome to our Envisioning for Electric Session. My name is Bill Meehan. This is Greg Hunt and over there is Pat Hohl.

There are five strategies or pillars that are driving utilities today. They are:

- 1) Safety
- 2) Asset Management
- 3) Grid Modernization
- 4) Customer Engagement
- 5) Innovation

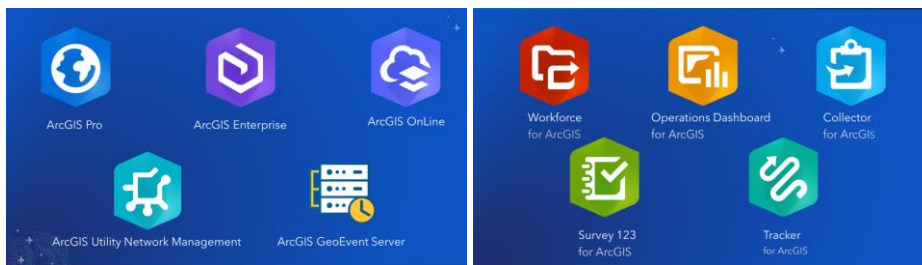
You will be hearing and seeing more about these at the booth and in presentations here at UC. Today we are going to concentrate on one of these pillars: safety. In a survey of participants at a recent webinar on safety 60% of those that responded said that GIS is an important element of their safety program.

Virtually everything the utility does requires attention to safety, whether that involves driving to the job site, to having good data about the network and of course doing field work safely.

We will focus on three areas of safety:

- 1) Adherence to regulations and good practices
- 2) Hazard identification
- 3) Community and staff awareness.

This is a story of how ArcGIS can transform one of the most common tasks that an electric company performs - a routine pad mounted transformer inspection. In many states, the state regulator requires that certain equipment be inspected on a regular interval. Failure to meet the regulations often results in fines. Failure to do the job safely can result in injury and customer outage.



Outside 3 - Server technology

Center 3 - Field apps

GREG THE DISPATCHER

In this session you will see
technology

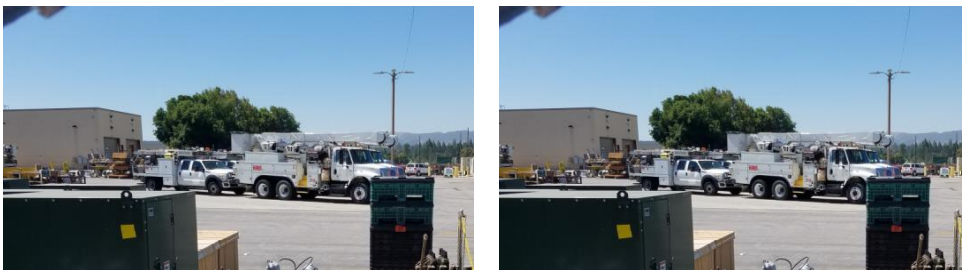
- 1) ArcGIS Pro
- 2) ArcGIS Online
- 3) ArcGIS Enterprise
 - a. ArcGIS Utility Network Management - an extension for ArcGIS Enterprise
 - b. ArcGIS GeoEvent Server
- 4) Workforce for ArcGIS
- 5) Operations Dashboard for ArcGIS
- 6) Survey 123 for ArcGIS
- 7) Collector for ArcGIS
- 8) Tracker for ArcGIS

There are two acts in our story.
Act 1 is how things are done today.
Act 2 is how the process can work
using ArcGIS

Bill will play the role of manager
as well as the narrator. Pat will
be a field worker. I will be the
dispatcher.

You, our audience will play the
rest of the field crews.

Let's begin. We are at the service
center where the manager is
briefing Pat and you, the crews.



Outside 4 - Service center

Center 4 - Service center

INT. CONFERENCE ROOM AT THE SERVICE CENTER - DAY

Pat sits in the audience. He interacts with the audience as
if they are other field workers.

MANAGER
(irritated)

I'm not happy. I just left a meeting yesterday with Sharon. (drawn out irritated..."SHAR-RON"). It was not a good meeting. She just reviewed our inspection report for this quarter. Way behind. She doesn't believe that we can make our numbers. I assured her that we can. She read me the riot act. If we don't get our act together, we will miss our targets. That means, we get fined by the state. Your friend doesn't like to get fined.

PAT

(from the audience)

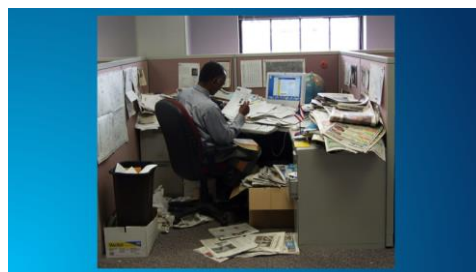
Boss, this has been a tough summer. Transformers were popping like crazy. I had to help the construction crews. Plus, we had a ton of cables fail. You know it takes forever to locate the direct buried stuff.

MANAGER

I explained the situation to her. She said, and I quote, "No excuses. Just get it done."

PAT

Did you tell her about the maps? They are a mess. All out of date. Half the time, the transformers are in the wrong place. Can't we get someone to update the GIS and print new map books. There are stacks of rolled up prints in the print room. No one has replaced the new prints for, I don't know? Months?



Outside 4 - Service center

Center 5 - Messy desk

MANAGER

Who's gonna do it? We don't have the staff. Just do your job. Never mind about other people's jobs. Now

go out there and get those inspections completed. Period.

Pat gets up and heads to the stage.

GREG THE DISPATCHER

Pat. Here is the routing sheet for your inspections.

Greg hands Pat a big map with red markings showing his work for the day.

PAT

Geez. I've never been able to inspect this many transformers in one day. What about overtime? I have a boat payment you know!

Manager overhears.

MANAGER

What was that? Overtime? Are you kidding? We are already over budget. Do this on straight time!

PAT

I'm gonna have a chat with my steward.

Pat storms off stage with the big routing map under his arm.

CUT TO:



Outside 5 - Traffic jam

Center 6 - Traffic jam

EXT. PAT'S TRUCK - DAY

He motions like he is getting into his truck. A chair sits in the between the stage and the audience. It is the truck. He sits down behind the wheel. Pat simulates the motion of the steering wheel.

PAT
(muttering to himself)
Rush, rush, rush.

With one hand on the wheel of the truck, he juggles the map.
Then bang.

Play car crash sound.

His truck hits the car in front that stopped short due to
traffic. He wasn't paying attention.

PAT
(Disgusted)
IDIOT! Unit 404 to dispatch.
Great. Traffic is backed up for
miles. What's going on? Dispatch?

GREG THE DISPATCHER
Go ahead 404.

PAT
I just had a non-injury TC traffic
collision. Get a cop over here. I'm
near 3321 Highland Pkwy.

GREG THE DISPATCHER
10-4. Glad you're OK. We'll also
notify management for you.

NARRATOR
That little miscue costs Pat 2
hours. By policy, he needs a police
report, an incident report, and
maybe a drug test

Pat finally arrives at his first
transformer location. He's now
hours behind schedule.

Pat gets out of his truck.

CUT TO:



Outside 6 - Pad mount transformer

Center 7 - Pad mount transformer

EXT. ON THE STREET OUTSIDE OF THE TRANSFORMER - DAY

Pat pulls out a paper form and begins his inspection. He lays his stack of inspection forms on the fender of the truck (the chair). Then a gust of wind blows the papers all over the audience.

PAT

Oh no! That's the last weeks' worth of inspections!

Pat collects the sheets from the audience and places them back into the folder.

GREG THE DISPATCHER

(over the radio)

Unit 404- What's your location?

PAT

At transformer PM1256. What's up? I'm just ready to do the inspection.

GREG THE DISPATCHER

Ok. Hold off. Troubleshooter 121 is working an outage near there. We need you to do some switching.

Greg looks at his paper map.

Let's see. Okay. You are only two blocks from a cable failure I need your help to open, block, and tag to isolate the failed cable section. Then, close to back feed and pick up the load. The section is dead as a doornail. Outage at 5 houses. Get them back on.

NARRATOR

Pat's upset. He will likely get a reprimand for the preventable motor vehicle accident. Now he may even

get another black mark for failing to meet his inspection quota for the day.

Before getting into his truck, Pat examines the big paper map to see if can locate the transformer with the outage. He gets in his truck and heads to the outage location.

PAT
Geez. I'm already backed up. I'll never get these inspections done!

CUT TO:



Outside 7 -Different Pad mount transformer
Center 8 - Different Pad mount transformer

EXT. OUTSIDE OF DEENERGNIZED TRANSFORMER - DAY

NARRATOR
He opens what he believes is the correct transformer. Doesn't put on any safety gear. He opens the door to the transformer. He reaches into the low voltage area to check the nameplate.

PAT
Owwee.

NARRATOR
Pat's arm contacts an energized secondary conductor.

PAT (CONT'D)
(on the radio)
404 to dispatch. I thought you said that transformer PM 1340 was dead. I just got a shock.

GREG THE DISPATCHER

(on the radio)
Are you okay?

PAT
Yeah.

GREG THE DISPATCHER
It should have been dead. Check the routing on the map. Are you at 35 Mesa View Lane? It's right outside there. Did you have your PPE safety gear on? Did you test?

PAT
No, no and no. I'm at 52 Mesa View.

GREG THE DISPATCHER
Ahhhh... You are at the wrong transformer. Are you OK to drive? Button it up. Make it safe and head to the clinic to be checked out. You'll also need an incident report. I'll send Paul out to finish up.



Outside 7 -Different Pad mount transformer
Center 9 - OSHA logo

PAT
People are still out of power. Let me just get them back.

GREG THE DISPATCHER
Nope. Sorry for them. You're done for the day. I'll notify management.

NARRATOR
What just happened?

- The company will likely get fined for missing their inspection targets - so will likely not meet regulatory requirements

- No real awareness of hazards in the field. Lack of good data.
- Disconnection between the field and the office. - Greg didn't even know Pat's location
- Bad communication
- Lack of good planning.
- A motor vehicle accident
- An injury
- Probably an extensive safety investigation from downtown!
- Customers left in the dark for longer than they should have been
- No work for the day

Thankfully Pat wasn't seriously hurt.

Let's see how this work flow is transformed by ArcGIS.



Outside 8 - Complete GIS
Center 10 - Complete GIS

GREG, THE DISPATCHER

Let's shift gears.

The company realizing that they needed to improve their field operations (and reduce the number of accidents), implemented ArcGIS for Field Operations. They have leveraged the complete GIS not only as system of record, but a system of engagement and a system of insight.

Let's join our utility crews in the conference room as they begin their work day- this time using ArcGIS.

CUT TO:



Outside 9 - Service Center
Center 11 - Service Center

INT. CONFERENCE ROOM AT THE SERVICE CENTER - DAY

Pat is back in the audience again, only this time he has an iPad with him.

MANAGER

Hi folks. Great news. Ever since we implemented ArcGIS we are ahead 40% of our inspections for the quarter. Now we can get to some outstanding maintenance work we have been putting off.



Outside 9 - Service Center
Center 12 - Safety signs

MANAGER (CONT'D)

First things first. Our weekly safety briefing. Greg, please outline the plan for our

inspections for today with a special focus on safety.

GREG THE DISPATCHER

As you know, accidents are caused by not paying attention to your surroundings. Also, by not having good information about your surroundings including any hazards that may be near you.

PAT

I know what you're going to say. The most hazardous part of the work day is the drive to the job site. Right Greg?

GREG THE DISPATCHER

That's right Pat. Remember we used to mark up a big map with your inspections laid out for the day. No more paper maps.

(How about an applause sign for the audience/field crews)

Today we make sure that we have information about areas to avoid - like those where there have been accidents.

Here, let me illustrate.



Need a transition between the demos

Outside 9 - Service Center
Center 13: Demo #1 (Desktop)

DEMO #1 - Spatial Analysis -using ArcGIS to determine areas of high vehicle accidents so the routing of crews will be established to avoid those high accident areas.

GREG THE DISPATCHER (CONT'D)
In the old days we treated each inspector as if they were the only person doing inspections. Let me show you the work load today in ArcGIS. It will show all the transformers to be inspected today. But you know in this business, things don't always go as planned, so we can reassign the work based on the condition on the ground.



Outside 9 - Service Center
Center 14: Demo #2 (Desktop)

DEMO #2 - The work load using Workforce.)

See, here is a map of today's work.

PAT (LOOKING OVER GREG'S SHOULDER)
It makes a big difference to see the work for the whole team in one place.

GREG THE DISPATCHER
Sure, you all have access to what others on your team are doing. If you happen to see something even if it isn't in your work plan, you can capture the data on your mobile device. Then everyone on the team, including me will see it. Good communication is the key to a safe environment. Finally, make sure you always wear your safety gear, even if you believe that the equipment is de-energized. Always test before touching. Even with safety gear on, you are dealing with a lot of energy. Questions? See you at the end of the day.

Pat leaves the conference room and gets in his truck

CUT TO:



Outside 10 - Truck
Center 15: Demo #3 (Mobile)

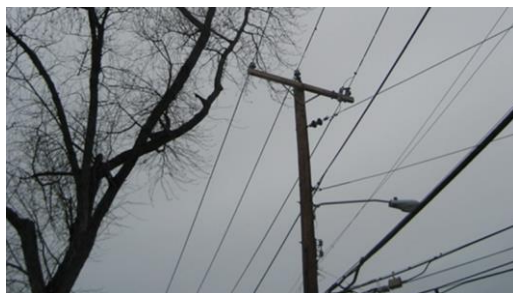
EXT. Pat's truck - DAY

DEMO #3 - Field view of Workforce.

NARRATOR

Pat walks out of the service center. Pat returns to his truck. He reviews his work for the day on his mobile device. Notice that he has the same view of the work as the dispatcher back in the service center.

CUT TO:



Outside 11 - Picture of overhead line
Center 16: Demo #4 - (Mobile)

EXT. ON THE STREET OUTSIDE OF THE TRANSFORMER - DAY

DEMO #4 - Field Collection of Issues - Collector

NARRATOR

Pat steps out of his truck. And does a quick assessment of the area. He glances down to the end of

the street, to the overhead line which feeds the underground system. Something isn't right. He sees a big tree limb ready to fall on the line. He captures the location, the line and the tree limb. While he can't work on it himself, he has immediately documented the issue.

Meanwhile back at the office Greg immediately views the damage Pat has captured as well as other issues that his other crews captured.

Greg views this on his field issues dashboard. I will now switch roles to the manager of the service center. I will visit the Pat in the field to see how the new technology is working out.

DEMO #5 - Field Issues Dashboard. (Back at the office shows all damage assessment - including Pat's)



Outside 11 - Picture of overhead line

Center 17: Demo #5 (Desktop)

MANAGER

Hi Pat. Thought I would see how you are doing. Haven't see the new technology in action in the field yet. Do you mind if I watch?

PAT

Sure. I'm using my mobile device to collect all the data about the transformer. Watch as I fill in the data. Simple.



Outside 12: Pad Mount Transformer

Center 18: Demo #6 (Mobile)

DEMO #6 - Field Inspection using Survey 123, (Pat does the Survey 123 inspection demo.)

MANAGER

Nice. I'll see you back at the service center

GREG THE DISPATCHER

(over the radio)

Unit 404. I see that you are only two blocks from a cable failure troubleshooter 121 is working on.

PAT

Correct At transformer PM1256. Maplewood east of Center St. What's up?

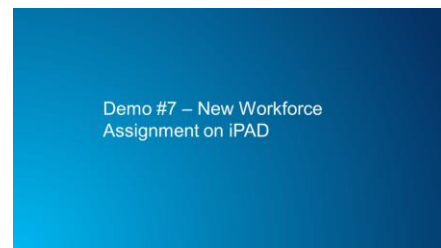
GREG THE DISPATCHER

(on the radio)

Ok - You are only two blocks from a cable failure Crew 121 is working. I need your help to open, block, and tag to isolate the failed cable section. Then, close to back feed and pick up the load.

Restore the customers. The transformer is presumed de-energized. Outage at 5 houses. I'll assign you the work.

CUT TO:



Outside 13 - Different Pad Mounted Transformer
Center 19 - Demo #7 (Mobile)

NARRATOR

Greg assigns the work to Pat. Pat drives to the new work location. Pat immediately sees his new work assignment on his mobile device.

EXT. OUTSIDE OF DE-ENERGIZED TRANSFORMER - DAY

DEMO #7 - New workforce assignment.)

NARRATOR

Now Pat needs to trace the network for connectivity. (moon?)

DEMO #8 - Utility Network Trace.



Outside 13 - Different Pad Mounted Transformer
Center 20 Demo #9 (Mobile)

Pat does the demo here.

PAT

Confirming. Open, block, and tag to isolate the failed cable section. Then, close to back feed and pick up the load. Got it. I'll check it out and do the switching.

NARRATOR

Pat puts on all his PPE safety gear. Opens the transformer. Operates the elbows with a switch stick. He then documents his switching activity.

Pat performs the switching and updates the location of the open loop in the circuit. The power for all customers has now been restored.

CUT TO:



Outside 14: Picture of the Service Center
Center 21: Demo #9

INT. CONFERENCE ROOM AT THE SERVICE CENTER - DAY

NARRATOR (CONT'D)

Back at the service center Greg is monitoring the activities of the crews. Many of the field people, both gas and electric work alone. They can become incapacitated, and can't get to their phone or radio, serious injury could result. While it is uncomfortable for management to monitor every movement of each crew member, ultimately monitoring and tracking their movement is critical. Further, if something does happen, the company will have vital documentation of the movements of the crew member.

Greg will illustrate.

GREG THE DISPATCHER

Great job folks. We did all our inspections. And we were lucky. We caught a couple of potential issues. Here let me show you.

DEMO #9 - Crew Tracking - (Greg does the last demo that shows a case where one of the crew members enters a hazardous area - active gas leak.)



Outside 15 - Simplified safety poster

Center 22 - Simplified safety poster

NARRATOR

What we saw was an incident free day.

- Met or exceeded the regulatory requirements
- High awareness of hazards
- Great staff awareness of hazards in the field.
- A much safer environment
 - No motor vehicle accidents
 - No personal injury
 - Faster warning of problems in the field.
- The inspections were fast.
- No wind blew away the forms.
- No paper.
- Customers were restored quickly.
- Lower cost, improved customer service and compliance.

Everything was done with safety in mind.



Outside 16: picture of the utility area at UC

Center 23: picture of the utility area at UC

PAT

Thank-you for attending our Envisioning Session. Bill and Greg - great job and thanks for keeping me safe!. Please visit our kiosks in the utility island to see more examples of utility workflows using ArcGIS. We have a lot of great content for you, if you scan your badge, we'll send it to your email. Be sure to get a copy of our new ebook - Digitally Transforming Utilities. . Have a great UC.



Outside 17: Science of Where
Center 24: Science of Where

FADE OUT