Visual Referencing Software Improves DISPATCHER RESPONSE

Comm center managers can learn from Polk County, FL's installation of a new visual locating solution that can identify a caller's whereabouts through landmarks, using a database of countywide, georeferenced aerial images.

| BY WILL SMITH, MARKETING MANAGER, PICTOMETRY INTERNATIONAL CORP.
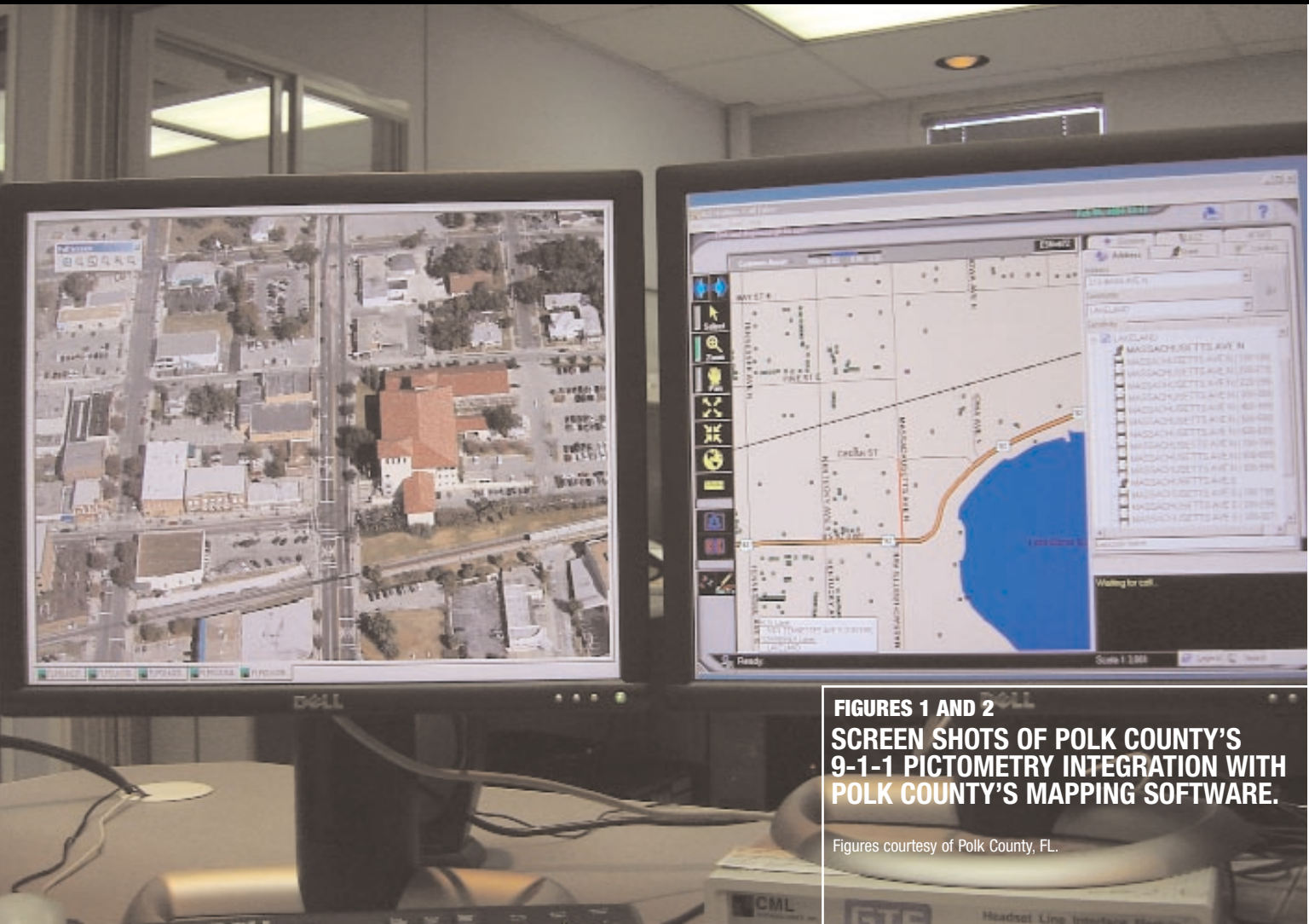
FIGURES 1 AND 2
SCREEN SHOTS OF POLK COUNTY'S 9-1-1 PICTOMETRY INTEGRATION WITH POLK COUNTY'S MAPPING SOFTWARE.

Figures courtesy of Polk County, FL.

ONE OF THE MANY CHALLENGES FACED IN TODAY'S hectic communication centers is not only trying to identify the exact location of where a call originates, but also determining what types of environmental or other obstacles may be present at the scene or along the way that could hinder a more timely response.

After recently integrating a new visual information system, Polk County, FL's 9-1-1 communications center took a cellular call from someone working at a construction site along one of the county's major highways. "All the caller could tell us was that he was having a heart attack and that he was near a warehouse," explains Ginger Rudiger, manager of Polk County's communication center.

Using the system's database of countywide, georeferenced aerial images, the dispatcher was able to narrow down to the caller's location and spot the warehouse where the man was located. "It took us less than a minute," says Rudiger.

The county, located in Central Florida, encompasses over 2,000 square miles between Orlando and Tampa. Larry Alexander, a 23-year veteran of law enforcement and Polk County's public safety director, has deployed the visual technology to his sheriff's department, fire department (including first responder vehicles), 9-1-1 and other agencies.

Rudiger is the program manager for the E9-1-1 center, the 3-1-1 customer response center and the emergency dispatch center. The centers have a combined staff of 60 personnel with additional staff scheduled to start in early 2005 as the countywide 3-1-1 program becomes fully operational. The countywide E9-1-1 center has eight 9-1-1 operators and one supervisor per eight-hour shift. "All of our nine workstations are equipped with the visual information technology as we have found it to be extremely useful in our operations," says Rudiger.

The technology has been integrated with Polk County 9-1-1's mapping software, making it the first in the country to have a combined display of mapping software that is linked directly to high-resolution, oblique imagery via the georeferenced coordinates contained in digital images.

As an inbound call comes into the communication center, the county's mapping software brings up a map of the caller's location on a monitor, as well as linking the map coordinates to an up-close image of the caller location from a data warehouse of countywide imagery. This visual information is then displayed on a second monitor that call takers can reference (**see Figures 1 and 2**).

"After adding the visual information system, the biggest difference we've noticed is how our call takers are better able to assist our first responders as they now have a visual view of where the first responders are going. Our call taker can clarify things like, 'It's the third house on the right,' or, 'Go through this intersection and turn left,'" says Alexander. "They can literally see the area, where before all they had was a flat map."

Not Your Father's Orthos

Aerial and satellite photography is not new. Many communities have extensive aerial and/or satellite photographs of their jurisdictions. Most of these photographs are typically orthogonal or straight down. This can make it difficult to discern whether you are looking at a parking lot or the flat roof of a multistory building (**see Figure 3**).

What *is* new is how 9-1-1 communication centers, like Polk County's, can integrate up-close, georeferenced images that are oblique—at an angle. This presents a more natural view of buildings, houses, roadway and landmarks, making the imagery much more user-intuitive than straight-down photography (**see Figures 4a and b**).

FIGURE 2

FIGURE 3

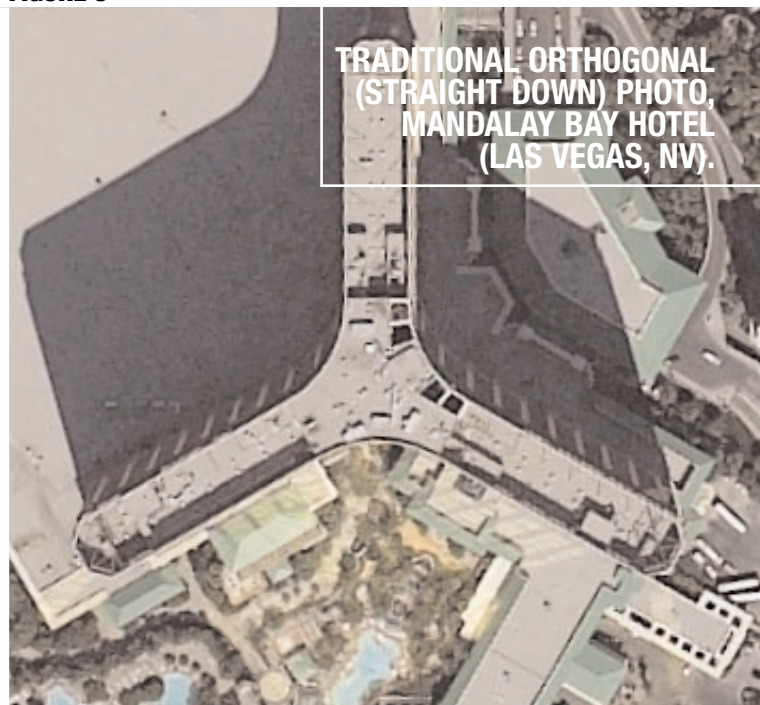TRADITIONAL ORTHOGONAL (STRAIGHT DOWN) PHOTO, MANDALAY BAY HOTEL (LAS VEGAS, NV).

FIGURE 4A

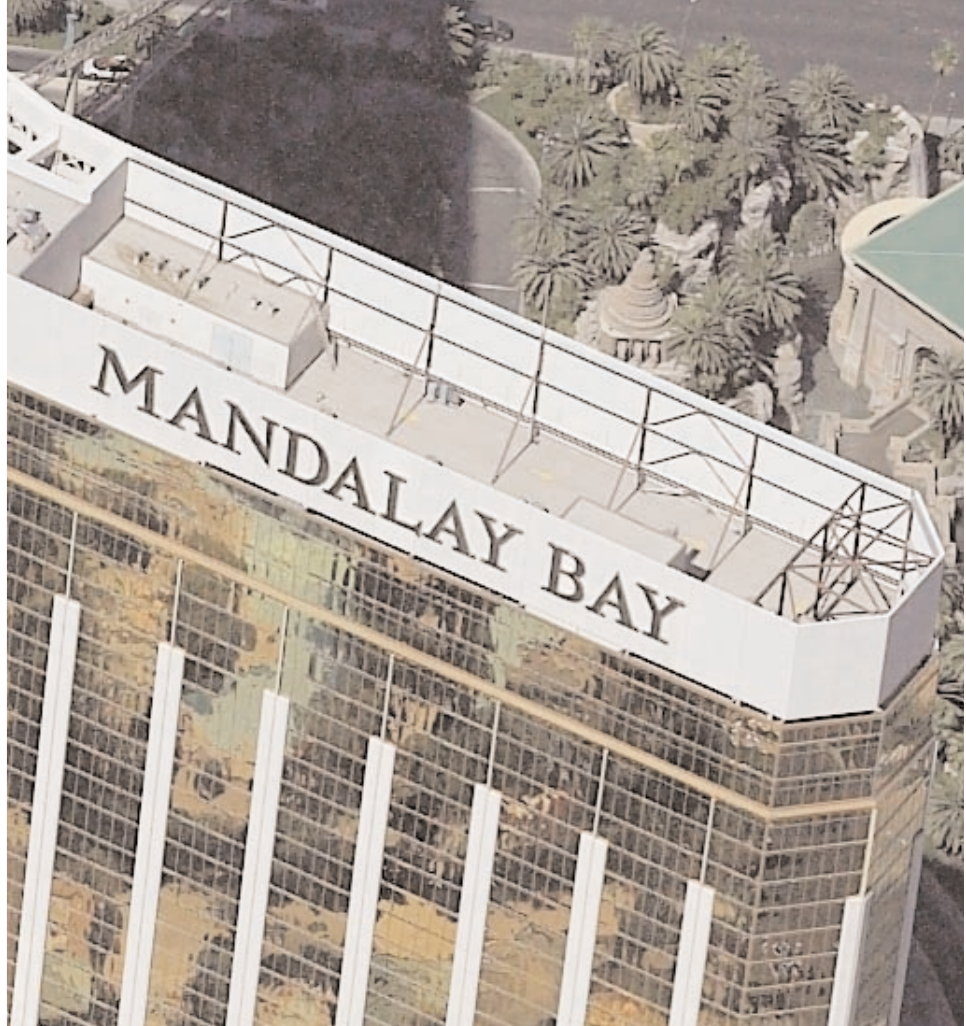Sample portion of Pictometry oblique image, Mandalay Bay Hotel, Las Vegas.

FIGURE 4B

Portion of a Pictometry Neighborhood Oblique image at optimal zoom. The detail of the imagery plus the measurement features on the software enables call takers and first responders to view and measure building and property attributes (distances, heights, elevations, widths, area, etc.) and obtain visual information to better respond to calls.

VISUALSOFTWARE

For Polk County, all of their 63,000-plus images are oblique. The images are also digital; organized into a data warehouse for instant access not only by the link from the mapping software, but they can also be accessed independently by clicking on a map point, entering X and Y coordinates, or by entering a street address. This gives Polk County dispatchers the ability to visually inspect a home, building, road or other structure all the way around, from up to 12 different views (**see Figures 5a, b, c and d**).

Demystifying and Democratizing Geospatial Data

Initially developed in the mid-1990s, the patented Pictometry software capture process produces images that are georeferenced. This means every pixel contains a wealth of geo-positional information that can be translated into useful location data for call takers and first responders. Think GPS for digital photographs. "We wanted to take a complex set of geospatial information, reorganize it in such a way that it could be mass deployed, and then make it easy to use by people who were not geospatial experts," says Stephen L. Schultz, CTO of Pictometry.

The technology is making inroads at almost 100 counties and the State of Massachusetts, as well as a number of federal agencies.

One of its early uses for public safety came when first responders from the Arlington fire department used it on the scene during the Pentagon incident on September 11, 2001.

Using the software, Polk County call takers and first responders can click on any point of an image and obtain measurements such as distances, heights, elevations, areas and other vital measurements. The imagery also contains location data, such as latitude and longitude coordinates that can be instantaneously translated to most any other coordinate system used by county, state and federal agencies.

"The software integrates very easily into our dispatchers daily activities," explains Alexander. "There was not a big training curve that we needed to overcome."

"We use it for a wide variety of applications, one of which is to get the height of a building," says Rudiger. "Often we are called upon to respond to a commercial or structural fire. We like to know how tall the building is so we can inform the fire department before they ever arrive on the scene. We have many lakes in the Polk County region. If we have an incident at one of these lakes, we can tell our first responders how large the lake is and how far across it is before they arrive on the scene."

Location, Location, Location!

While this may make an interesting mantra for the real estate profession, locating the points of origin for 9-1-1 calls, especially wireless, continues to be a hot conversation topic for 9-1-1 managers.

"We have a heavily traveled corridor between Orlando and Tampa. Florida's Interstate Route 4 brings us hundreds of thousands of travelers coming into our county as well as traveling through the county between Orlando and Tampa. As a result, many cellular callers are unsure of their locations when they call 9-1-1 compared to our county residents who are familiar with local landmarks, nicknames for the surrounding areas and buildings. This poses a challenge in identifying where these wireless calls originate," says Rudiger.

The 9-1-1 center also faces some unique challenges even from land-based phones because of the county's location between major attractions. For example, Rudiger notes that the county has a subdivision in its northwest region that has a high percentage of rental homes leased to international guests on a four- to six-week basis. "When we get a call from this area or an alarm goes off, callers are not always able to confirm their address, instead, often giving us their 'real' address," explains Rudiger.

In these types of situations, the visual references, whether working with a land-based phone call or wireless call, enables Polk County dispatchers to more easily and often more quickly pinpoint the location of the caller.

"We find that our visual reference system enables us to ask questions like, 'Are you in the yellow house or the beige house?' This also is useful when the ALI is incorrect or if an area has recently been re-addressed and the records have yet to be updated in the ALI database. For wireless calls from visitors traveling through our area, if they can tell us what they have just driven by or what landmark they are next to, we can find these images and see where they are located," adds Rudiger.

Turning Night into Day

Nighttime calls provide their own set of challenges for dispatchers. "This system eliminates a lot of the mystery surrounding a nighttime call by letting dispatchers virtually see the areas of the inbound call as they truly are in the daytime," says Alexander. "This

FIGURE 5B: South view

FIGURE 5C: East view

FIGURE 5A

Pictometry image—Polk County Historical Museum Building (North View).

FIGURE 5D: West view

gives them a better understanding of the incident areas in communicating to the caller as well as assisting first responders on the way."

For the Polk County SWAT team, having the visual information system enables the team to better manage their rapid deployments by instantly viewing incident areas. Calls requiring law enforcement are routed from Polk County's 9-1-1 communication center to the sheriff's dispatchers. The sheriff's department currently has its system installed in its command vehicles with portable printers, as well as in its command center.

"If you're deploying a SWAT team at night, this lets you have a chance to look at the daylight photos of the area—you can see what's in the backyard and things that you can't see at night if you're trying to do a reconnaissance," explains Polk County Sheriff's Office Special Operations Division Director Major Francis Hart.

The county has used the system on a number of responses where armed suspects had barricaded themselves. Hart adds, "Our county is so big that the chances that everyone knows all the details of any given incident area are slim," says Hart. "We use the measurement features and imagery to determine our deployment options, measure line of sight and other distances, consider where road blocks need to be set up, and then share this information to officers responding to the call. From a tactical standpoint, it's the best that you can get your hands on other than being there at the moment."

Interoperability

In addition to the 9-1-1 center and the sheriff's department using the system, the visual information also is used by the county fire department (countywide site license enables unlimited usage by all county agencies). Soon after getting it installed in their fire chief's command vehicles, a fire at a plastics manufacturing facility put the visual information system through a major test.

"As the chief arrived on the scene, the fire was already engulfing the structure," says Alexander (**see Figure 6, page 33**). "Using this visual reference solution on a laptop computer in his command vehicle, the chief was able to pull up and print several high-resolution images of the scene to look through the smoke to stage the apparatus to combat the blaze." (**see Figures 7 and 8, pages 33 and 34**).

For homeland security measures, Polk County public safety agencies can pre-plan and evaluate threat assessments for responses using their high-resolution imagery database and mapping software. The imaging software enables end users to attach files such as blueprints, internal structural videos and other response plans.

"Overlays, such as plume data or other third-party information that measures or predicts the impact of wind-carried chemicals or biological agents, can also be added on top of the visual images," notes Dan Pennacchia, senior vice president of sales and marketing at Pictometry. The visual data and supporting documents can then be stored and shared by county agencies as well as shared with other counties that have this new visual information system.

Future Plans

Alexander says the county has a number of future plans for the mapping and imagery system that will extend its use through every department in the county. "We are going to a mobile data terminal system so that every responder vehicle and ambulance will have this information at their finger tips." He concludes, "Any aid we can give to call takers to assist them in directing response units is a plus.


Figure courtesy of Polk County, FL.

FIGURE 8
Polk County fire department, placement of apparatus after viewing Pictometry image.

Figure courtesy of Polk County, FL.

The visual reference is invaluable, helping our dispatchers get responding units to arrive on the scene quicker, and more accurately." **ENPM**

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Images from a standard Pictometry Image Library.
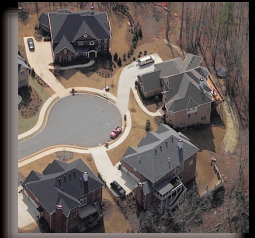
Side 2 — West View
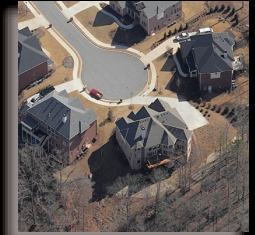
Side 3 — South View

Side 4 — East View

Side 1 — North View   Orthogonal — Top View

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See Everywhere

In seconds, 9-1-1 call takers can have easy access to high-resolution imagery of every square foot of their area from as many as twelve different views.

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Plan Everything

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