How FirstNet Deployables Are Supporting Public Safety

Introduction

In 2017, the First Responder Network Authority awarded a contract to AT&T to build and maintain FirstNet—the Nationwide Public Safety Broadband Network. Under the agreement, AT&T-FirstNet is required to complete the nationwide build-out of the FirstNet network by March 2023. This involves deploying Band 14—the spectrum dedicated to public safety—across statewide radio access networks in states and territories throughout the United States.[1] In March 2020, AT&T announced that the build-out of the FirstNet network was 80% complete, putting implementation approximately a year ahead of schedule.[2]

Another important (but sometimes overlooked) aspect of the FirstNet contract is a requirement that AT&T develop and deploy a fleet of mobile communications assets—"deployables"— to support law enforcement, fire, emergency

medical services, and other public safety operations. These deployables include land-based vehicles and airborne assets. They are designed to temporarily boost FirstNet capacity and coverage for public safety agencies to meet high levels of demand, or in some cases to provide coverage in remote areas where the communications infrastructure is limited.

Deployables are used during unexpected events, such as hurricanes, wildfires, and other natural disasters where the existing communications infrastructure is damaged or unavailable, or where extra capacity is needed. (See page 8 for a summary of how FirstNet deployables have been used during the COVID-19 pandemic.)

Deployables also can be used during planned events, such as major sporting events, festivals, and demonstrations where large crowds of people strain the capacity of commercial cellular networks and the communications needs of public safety agencies are intensified.

Deployables are available to FirstNet subscribers 24/7 and can be requested through an agency's AT&T-FirstNet representative or a dedicated, toll-free customer service line.

Over the past two years, as the Police Executive Research Forum (PERF) has studied the implementation of FirstNet, we have examined the development of deployables and the experiences of public safety agencies that have used these mobile assets in a variety of situations. This report summarizes our research, including information

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1. Band 14 is spectrum the Federal Communications Commission licensed to the First Responder Network Authority specifically for use by public safety personnel on FirstNet. Band 14 resides in the 700 MHz band which, according to the FCC, is an important swath of spectrum that allows signals to cover larger geographic areas and to penetrate buildings more easily.

2. Jackson, Donny, "FirstNet buildout 80% complete, serves 1.2 million subscribers, AT&T exec says." *ICWE's Urgent Communications*, March 12, 2020. https://urgentcomm.com/2020/03/12/firstnet-buildout-80-complete-serves-1-2-million-subscribers-att-exec-says/.
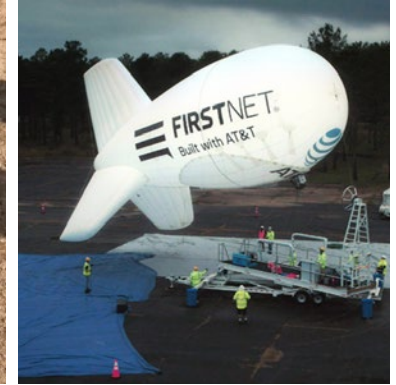
about deployables that was gathered from two regional FirstNet forums PERF held in Atlanta (March 2019) and San Jose (October 2019).[3] The report also presents lessons for public safety agencies about how to effectively utilize this important resource of the FirstNet program.

What Are FirstNet Deployables?

FirstNet deployables are mobile cell sites that link to the FirstNet network via satellite. They provide similar capabilities and connectivity as a cell tower, but they do not rely on the availability of commercial electrical power to operate. This is important in remote areas or when a natural disaster has disrupted electrical utilities in a region.

AT&T-FirstNet currently has a fleet of 76 deployables that are dedicated to FirstNet subscribers. They include:

- **72 SatCOLTs (Satellite Cell on Light Trucks) and COWs (Cell on Wheels).** These are land-based vehicles that can be transported to locations where additional coverage is needed. The SatCOLTs can be loaded onto C-130 transport planes and flown to distant locations, which AT&T-FirstNet did following back-to-back hurricanes in Puerto Rico in 2018. The smaller COWs provide more flexibility in reaching remote locations where a SatCOLT cannot be driven.

- **3 "Flying COWs."** These are essentially tethered drones that are equipped with a satellite dish, fiber connections, and Band 14 connectivity. They can be flown up to 400 feet in the air, which provides a wide coverage area over the tops of tree lines and buildings in many places. Flying COWs can be especially suitable for situations such as wildfires and mountain rescue missions where rugged terrain makes it difficult to maintain connectivity. Because they are tethered to a power source on the ground, the Flying COWs can operate for 23.5 hours at a time, requiring only about a half-hour per day for inspection and maintenance.

- **1 Aerostat.** Unveiled in December 2019 and dubbed FirstNet One, this 55-foot "blimp" can provide FirstNet coverage from a height of about 1,000 feet, which allows the aerostat to cover a much wider area than other deployables. AT&T-FirstNet officials estimate it would take 3 to 5 SatCOLTs to cover the geography of FirstNet One.[4] Another advantage of the aerostat is that it can be deployed for up to three weeks at a time, before it needs to be brought down for maintenance. A tether supplies the unit with power and fiber connectivity to a deployable on the ground.

FirstNet One had its first operational deployment in September 2020 immediately following Hurricane Laura, a Category 4 storm

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3. Most of the quotes in this report are taken from the Atlanta and San Jose FirstNet regional forums.

4. Jackson, Donny, "FirstNet One deployable blimp provides LTE coverage option for longer-term response efforts." *ICWE's Urgent Communications*, Dec. 23, 2019. https://urgentcomm.com/2019/12/23/firstnet-one-deployable-blimp-provides-lte-coverage-option-for-longer-term-response-efforts/.

The First Responder Network Authority has published a two-page fact sheet that explains the FirstNet deployable program: https://firstnet.gov/sites/default/files/FirstNet_Deployables.pdf.

"California was able to get six deployables, and in 2018, we had two really serious fires at the same time, one in the north one in the south. So we were able to get four more deployables from surrounding states, which is the way the system is supposed to work."

Kim Zagaris
Western Fire Chiefs Association

FirstNet deployables supported over 450 operations in 2019, including hurricanes, wildfires, floods, and major events. By comparison, there were approximately 100 deployments in 2018.

that made landfall in Louisiana.[5] Launched in the skies over Cameron Parish, the aerostat provided first responders with connectivity as they worked to protect their communities and restore normal operations.

In addition, AT&T-FirstNet has deployed on-island portable cell sites in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. These assets can be especially important in support of typhoon recovery operations and other disasters.[6]

Deployables are available to FirstNet subscribers 24 hours, seven days a week. There is no charge to FirstNet agencies that request these assets. During 2019, FirstNet deployables supported more than 450 operations, including hurricanes, wildfires, flooding events, search-and-rescue missions, and major events with

large crowds. That compared to approximately 100 deployments in 2018.

In addition to the dedicated FirstNet deployables, public safety agencies that subscribe to FirstNet have access to AT&T's fleet of commercial SatCOLTs and other mobile assets. Having these supplementary resources can be valuable for potentially catastrophic events or when several major incidents are happening at once around the country. For example, in advance of Hurricane Dorian in 2019, AT&T-FirstNet pre-staged several dozen deployables—both FirstNet and commercial units—in locations that were expected to be hit hard.

The Response Operations Group (ROG) Manages the Deployables Program

The FirstNet deployable program is managed by the Response Operations Group (ROG) of AT&T-FirstNet. Having a centralized unit oversee the program allows managers to take a national view of public safety needs, constantly assessing what assets may be needed and what deployables are available. In addition to a dedicated national response manager, the ROG includes regional response managers who are tasked with monitoring specific parts of the country. This structure helps ROG to field multiple requests and support multiple major events at the same time.

FirstNet deployables are housed at more than 40 secure locations across the country. Having the deployables dispersed around the country allows the ROG to more efficiently pre-stage units to locations where natural disasters are occurring (or are predicted to occur) and to planned events

5. Weinschenk, Carl, "FirstNet One, a Public Safety Blimp, Deployed in Louisiana for Hurricane Disaster Recovery Support." *telecompetitor*, Sept. 8, 2020. https://www.telecompetitor.com/firstnet-one-a-public-safety-blimp-deployed-in-louisiana-for-hurricane-disaster-recovery-support/.
6. "FirstNet deployed in Guam, CNMI, American Samoa." *Pacific Island Times*, May 27, 2020. https://www.pacificislandtimes.com/single-post/2020/05/28/FirstNet-deployed-in-Guam-CNMI-America-Samoa.

such as the Super Bowl. As part of its contract, AT&T-FirstNet is required to have a deployable up and operational within 14 hours of when a request is first received. Officials report that the actual deployment time is usually much faster.

To guide the deployment of assets, the FirstNet Response Operations Program operates within the framework of both the National Incident Management System (NIMS) and the Incident Command System (ICS), developed by the Federal Emergency Management Agency (FEMA).[7] This approach helps the ROG to prioritize deployments based on a number of situational awareness factors, including life safety, incident stabilization, and property conservation. It also ensures that the deployment of mobile assets aligns with the work of public safety agencies during critical incidents.

"We are engaging directly with the emergency operations centers and integrating the deployables into the existing plans under Emergency Support Function #2, Communications," said Ryan Burchnell, Director of Policy and Strategy for AT&T-FirstNet and a retired Major with the Florida Highway Patrol. "By integrating directly into those plans, we know exactly what is needed in the time of an

> "While we were handling wildfires in California, we were also handling the aftermath of Hurricane Michael and flooding in Texas. Somebody is responsible as our national response director every day. That person is seeing the whole country. Based on what's happening around the country, there are regional response managers who are looking at certain parts of the country and coordinating with the national response director."
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> *Ryan Burchnell*
> *Director of Policy and Strategy,*
> *AT&T-FirstNet*

emergency." To improve communications, ROG personnel work closely with individual response liaisons at the state and local levels who have been trained in NIMS and ICS.

Requesting a FirstNet Deployable

Because FirstNet deployables are dedicated to FirstNet customers, agencies must be a current FirstNet user to request a deployable. FirstNet deployables are not directly available to customers of other carriers, although those agencies can at times access FirstNet deployables (and FirstNet-ready devices) through mutual-aid responses with agencies that are on FirstNet.

There are two ways for an agency to request a FirstNet deployable:

1. Through the agency's AT&T-FirstNet representative, with whom the agency has regular contact on FirstNet issues, or

2. By calling a dedicated, toll-free customer service line for FirstNet subscribers.

Requests for deployables can be made 24 hours a day, seven days a week.

AT&T-FirstNet staff members evaluate requests and triage the issue the agency is trying to resolve, and then determine the most appropriate response. In some cases, that may mean sending a FirstNet deployable. In others, it may be possible to solve a problem by making adjustments to the existing network. Sometimes, AT&T-FirstNet starts sending a deployable to the scene, even as technicians work to address the issue in other ways.

For SatCOLTs, which make up the majority of the FirstNet deployable fleet, there are a few basic site requirements that much be met. These include a 100 foot-by-100 foot area to park the deployable, ample vertical space for the 60-foot mast, and a clear view of the southern sky.

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7. For background on NIMS and ICS, see https://training.fema.gov/nims/.

Future Investments in FirstNet Deployables

In August 2019, the First Responder Network Authority released its Roadmap, a 20-page report that is guiding the Authority's future investments in the FirstNet network.[8] Release of the Roadmap followed nearly 1,900 engagements that the Authority had with public safety personnel across the country.
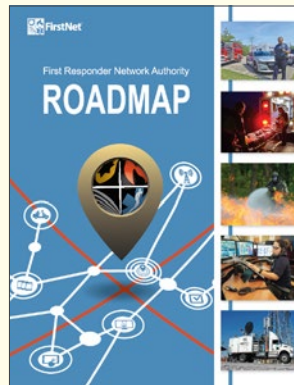
The Roadmap is organized into six domains, including Coverage and Capacity. One of its priorities under that domain is to "grow and enhance the deployables fleet."

Recently, the FirstNet Authority Board voted to make additional investments in the FirstNet fleet of deployables beyond the 76 units currently available to FirstNet subscribers. At its June 2020 meeting, the Board approved a resolution directing $218 million in investments in two areas: 1) expansion of the FirstNet fleet of deployables to enhance network coverage and capacity for public safety during emergencies and events and 2) initial generational upgrades to enable 5G network capabilities.[9]

> *"We have seen firsthand the technical and operational benefits of having a deployable fleet. We understand how well it's working for public safety when they ask for it, how they use it, and the improved performance when it's available. So the FirstNet Authority is going to use some of the money we have available for network investments to increase the fleet, to grow the number of dedicated deployables that will be available to public safety."*
>
> **Dave Buchanan**
> **Executive Director for Public Safety Advocacy**
> **First Responder Network Authority**

How Public Safety Agencies Are Using FirstNet Deployables

Following are four examples of how FirstNet deployables have been used to support public safety operations during natural disasters and planned events: Hurricane Michael in 2018, California wildfires in 2018, Hurricane Florence in 2018, and Super Bowl LIII in 2019.

Representatives of many of the agencies involved in these events participated in FirstNet regional forums that PERF held in 2019, where they discussed their experiences.

Hurricane Michael

On October 10, 2018, Hurricane Michael made landfall in the United States near Tyndall Air Force Base and Mexico Beach, FL, as a Category 5 storm. It was the first Category 5 hurricane to hit the U.S. since Hurricane Andrew in 1992 and only the fourth such U.S. storm on record.[10] Hurricane Michael produced winds of up to 155 miles per hour and a storm surge of 9-14 feet above ground level. Overall, the storm resulted in an estimated $25 billion in damage.[11]

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8. See https://www.firstnet.gov/sites/default/files/FirstNet_Roadmap.pdf.

9. "FirstNet Authority Board Approves Network Investments for 5G, On-Demand Coverage." First Responder Network Authority, News Release, June 17, 2020. https://www.firstnet.gov/newsroom/press-releases/firstnet-authority-board-approves-network-investments-5g-demand-coverage

10. "Hurricane Michael upgraded to a Category 5 at time of U.S. landfall." National Oceanic and Atmospheric Administration, April 2019. https://www.noaa.gov/media-release/hurricane-michael-upgraded-to-category-5-at-time-of-us-landfall

11. Beven III, John L.; Robbie Berg; and Andrew Hagen. *National Hurricane Center Tropical Cyclone Report: Hurricane Michael*. National Oceanic and Atmospheric Administration, May 2019. https://www.nhc.noaa.gov/data/tcr/AL142018_Michael.pdf

"Communication is the number one requirement after any catastrophe. If you don't have communications, information is being left out. I gained peace of mind that my officers were fine because I was able to identify everybody by using the FirstNet phones that were sent."

Chief Anthony Kelly
Mexico Beach, FL Police Department

"Right after the storm passed through, I started texting AT&T-FirstNet saying we were going to need deployables. We were setting up a command post off the interstate at a weigh station, and AT&T sent a deployable to us, because we had zero network connectivity. Once they did that, we were able to use the command post and get people online sharing data.

"One of the biggest lessons we learned was that there is still a level of expectation management on what communications functionality is going to be available in events like this. At any given time, there were 100 to 150 patrol cars in the area using data, all from that one deployable, because it was the only network available. So you may have to manage how people are using data in situations like these."

Major Timothy Roufa
Florida Highway Patrol

Mexico Beach suffered some of the greatest damage. The storm surge reached its highest peak in Mexico Beach, and caused three drowning deaths. Of the 1,692 buildings in town, 809 were destroyed and 775 were damaged.

The Mexico Beach Police Department began preparations three days prior to the storm's landfall, when models first indicated the town might be in the direct path of the storm. A major focus of the Police Department's efforts was to warn residents to evacuate. The department then worked throughout the storm and afterwards to protect the safety of residents who did not heed evacuation warnings.

Complicating the department's response was the destruction of most of the town's infrastructure, including communications. The department's cellular devices were inoperable, because all commercial carriers suffered blackouts from the storm. Cell towers were toppled in some cases, with the top of the tower touching the ground. Two days after the storm hit, Mexico Beach Police Chief Anthony Kelly was able to make contact with a regional information center that had

been set up 50 miles from Mexico Beach. Although the department was not a FirstNet customer, because of the emergency conditions it was able to gain access to FirstNet mobile devices, which were assigned to Mexico Beach police officers.

Chief Kelly said the restoration of communications was critical. Once the phones were deployed and operational, Mexico Beach police officers were able to readily communicate with one another for the first time since the storm had wiped out communications. Officers could coordinate their locations and take photographs for evidence purposes, among other applications.

To provide coverage in the area, AT&T deployed a FirstNet SatCOLT to Mexico Beach. The deployable allowed officers from different agencies to communicate with one another as well as with other public safety partners, including medical providers. Officers also had access to mapping applications, which enabled them to conduct search-and-rescue efforts more accurately and effectively.

"The thing that worked for us on Mexico Beach post-Michael was the FirstNet [deployable]

that came in," said David Merrick, Director of Emergency Management at Florida State University, which supported the response to the hurricane. "That was the first communications we had that were functional on Mexico Beach."[12]

California Wildfires

In 2018, the West Coast suffered one of its most destructive fire seasons. In California alone, public safety personnel responded to 7,639 wildfires, many of them in remote or sparsely populated areas.[13] November 2018 proved to be an especially challenging month for California. Numerous wildfires broke out across the state, worsening an already destructive and deadly wildfire season.

The Camp Fire, Woolsey Fire, and Hill Fire were three of the most destructive fires, and all started on the same date—November 8. Among the three fires, more than 250,000 acres of land were impacted, requiring a massive response by public safety personnel.[14] Camp Fire ended up being the deadliest wildfire in California history, resulting in 86 deaths and destroying 15,000 homes.[15] Strong winds and little rain made the fires particularly difficult to control.

Complicating the emergency service response was the destruction of critical communications infrastructure. Numerous commercial cell sites were destroyed by the fires, including 17 cell towers in the Camp Fire alone. Poor air quality and fire conditions hindered telecommunications companies as they tried to repair the infrastructure. And residents and business owners trying to communicate via cell phones and other mobile devices put higher-than-usual strains on communications networks that were at reduced capacity because of the fires.

To provide firefighters and other public safety personnel with coverage and capacity, AT&T sent 10 deployables to the regions most impacted by the wildfires. This included six SatCOLTS deployed to the Los Angeles Fire Command Camp and the Paradise Police Department.

One of the advantages of having mobile communications assets during a wildfire is that as the fire line moves, so can the deployables, enabling a consistent level of coverage.

"For the California wildfires, we were supporting mainly out-of-state folks. The Oregon and Washington state fire teams and Incident Management Teams were coming in for the fires, and we were there supporting those teams. The key message here is that no matter where you go on mutual aid, if you need services through our Response Operations Group, they're available."

Ryan Burchnell
Director of Policy and Strategy
AT&T-FirstNet, Response Operations Group

"We've actually made requests on several wild land fires through the state to pre-deploy those deployables. Because we know we've got a lot of mutual aid moving in, we wanted to get them in place. You don't have a lot of time to figure this out."

Kim Zagaris
Western Fire Chiefs Association

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12. "Integrating FirstNet deployables during a cybersecurity attack," First Responder Network Authority, March 23, 2020. Video available at https://firstnet.gov/newsroom/blog/integrating-firstnet-deployables-during-cybersecurity-attack.

13. "2018 Incident Archive," CalFire. https://www.fire.ca.gov/incidents/2018/

14. Ibid.

15. Associated Press. "Camp fire death toll rises to 86 after man dies of burn injuries," *Los Angeles Times*, August 8, 2019. https://www.latimes.com/california/story/2019-08-08/camp-fire-death-toll-rises-to-86-after-man-dies-of-burn-injuries

FirstNet Deployables Support the Response to the COVID-19 Pandemic

During the COVID-19 pandemic, FirstNet deployables have been used to bolster data and voice communications for public safety agencies, medical service providers, and other emergency responders. Here are a few examples of how FirstNet deployables have been used during the pandemic:

Naval Hospital Ships

Early in the pandemic response, as coronavirus cases were surging on both coasts, the U.S. Navy deployed two medical treatment ships: the USNS Comfort to New York City and the USNS Mercy to Los Angeles. These fully functioning naval hospitals were designed to alleviate overcrowding in local hospitals by handling any overflow of non-COVID-19 patients. FirstNet deployables were sent to ports in both cities to ensure interoperable connectivity among military personnel, nurses and physicians, and first responders operating in and around the temporary hospitals.

In addition, while the Navy carrier USS Theodore Roosevelt was docked in Santa Rita, Guam, following a coronavirus outbreak aboard the ship, AT&T-FirstNet deployed a portable cell site to provide additional capacity there.

Patient Transports

At the height of the pandemic in New York City, hundreds of ambulances from outside the region were brought to the city. These additional ambulances, mostly from private services, were staged at Fort Totten Park in

Queens and Randall's Island in the East River. FirstNet portable cell sites were deployed at both locations to increase network capacity for first responders and command staff members.

Because the ambulances did not have compatible radio or CAD systems, they were outfitted with ruggedized FirstNet-ready devices from Sonim. This allowed the ambulance operators to communicate with other first responders via enhanced push-to-talk service, and it provided a connection to the city's dispatch console.

Medical Centers

In northern California, a FirstNet COW (Cell on Wheels) was deployed to a medical center to provide additional communications capacity and help keep critical care physicians, ER nurses, remote and other staff members connected.

Navajo Nation Support

As COVID-19 began to threaten the Navajo Nation, FirstNet deployed two SatCOLTs placed at the Navajo Nation Administration Building in Window Rock, Arizona, and the Navajo Nation Department of Transportation Tse Bonito Office in New Mexico. These deployable assets resolved connectivity and communications issues in these remote areas, providing tribal first responders with the coverage and capacity to more effectively respond to the pandemic.

COVID-19 Testing Sites

FirstNet deployables have been used to expand coverage in areas doing large volumes of drive-through testing for the coronavirus. In Conyers, GA, for example, officials were conducting approximately 1,200 tests a day. A FirstNet SatCOLT was brought in to increase the capacity for data and voice communications for health care workers and first responders.

Throughout the pandemic, FirstNet deployables and other devices have been used to support quarantine zones, airports, Emergency

Operations Centers, and other public safety centers in the following locations:[16]

- Port of Oakland, CA
- Riverside, CA
- San Diego, CA
- New Haven, CT
- Atlanta, GA
- Fulton County, GA
- Marietta, GA
- Rutledge, GA
- Nassau County, NY
- San Antonio, TX

By April 2020, 14 portable cell sites were in operation and more than 28 had been deployed in support of the COVID-19 response.[17]

Remote Dispatch

Another example of how FirstNet supported public safety during the COVID-19 pandemic comes from Alexandria, VA. In the early spring, as the pandemic began to spread and social distancing and other prevention efforts were going into effect, emergency communications officials moved to implement "Remote 911," which allows some call-takers and dispatchers to operate from locations other than the city's primary emergency communications center.

As part of its continuity of operations plans, Alexandria already had several CommandPost kits—consisting of a phone, headset, laptop, mobile router, and second monitor, all housed in a ruggedized case— that telecommunicators could set up at their homes. With the hardware in place, officials had to determine how best to connect the remote telecommunicators to the city's dispatch systems.

Concerned that the commercial Internet Service Providers at employees' homes might not meet reliability and security requirements, Alexandria established FirstNet hot spots to connect their remote workers. With connectivity established, staff could access an open "position" in the emergency communications center and operate with full functionality as if they were physically located at the center.

Alexandria began remote call-taking operations on March 6. During the first month, telecommunicators handled only non-emergency calls to ensure that the system operated properly. After that proved successful, the city began receiving and dispatching 911 emergency calls remotely.

16. Underwood, Kimberly. "Ensuring FirstNet Connectivity During the COVID-19 Crisis." *SIGNAL AFCEA*. March 2020. Available at https://www.afcea.org/content/ensuring-firstnet-connectivity-during-covid-19-crisis.

17. Hill, Kelly. "FirstNet-AT&T supporting naval hospital ships in New York, Los Angeles." *RCR Wireless News*. April 1, 2020. https://www.rcrwireless.com/20200401/carriers/firstnet-att-supporting-naval-hospital-ships-in-new-york-los-angeles

At the time of the 2018 California wildfires, the state had not yet signed its contracts with AT&T-FirstNet, so California agencies battling the wildfires had no way of accessing FirstNet services, including deployables. But because fire teams from Oregon and Washington state were in California supporting the operation, AT&T was able to deploy FirstNet assets in the state that California personnel could take advantage of.

Hurricane Florence

Shortly before Hurricane Michael hit Florida in October 2018, Hurricane Florence brought severe flooding to the Carolinas. Hurricane Florence was a long-lasting storm, officially active from August 31 through September 17, 2018. It went through several phases of rapid intensification and weakening, before eventually making landfall as a Category 1 storm on September 14 near Wrightsville Beach, NC.[18]

Hurricane Florence resulted in the deaths of 22 people and caused $24 billion in damages.[19] Flooding presented the biggest danger from the storm, with a maximum storm surge reaching 8 to 11 feet above ground level in North Carolina.[20] In addition to the storm surge, heavy rainfalls added to the flooding danger. In Whiteville, NC, more than 25 inches of rain fell during the storm.[21]

"When Hurricane Florence came up the East Coast, in Whiteville, NC, the LMR system went down and the commercial networks went down. The only thing that was up and running was FirstNet. We had our deployables there. And using push-to-talk solutions over the broadband network, (Emergency Services Director) Hal Lowder was able to communicate and move resources to where they were needed, in a way that otherwise he wouldn't have been able to do."

Ed Parkinson
CEO, First Responder Network Authority

In the midst of heavy rainfall and tornado warnings, public safety personnel were responding to numerous rescue requests.

Public safety communications were impacted when the county-owned land mobile radio (LMR) system that serves Whiteville was knocked offline during the storm. Whiteville had signed on with FirstNet service in June, primarily to enhance data communications among police and other first responders. But when the LMR system (which relies on proprietary technology) went down, Whiteville's public safety personnel and some mutual aid responders turned to FirstNet. First responders activated the enhanced push-to-talk feature (using Kodiak from Motorola Solutions) to maintain voice communications over their mobile phones.

Even though voice transmissions over FirstNet were continuing, public safety officials noticed some delays in transmitting data over

18. Stewart, Stacy R. and Robbie Berg, *National Hurricane Center Tropical Cyclone Report: Hurricane Florence*, National Oceanic and Atmospheric Administration, May 2019, p. 2-3. Available at https://www.nhc.noaa.gov/data/tcr/AL062018_Florence.pdf
19. Ibid, p. 8-9
20. Ibid, p. 6
21. "Record rainfall: Some saw almost 3 feet from Florence," *WRAL.Com*, September 17, 2018. Available at https://www.wral.com/florence-causes-record-rainfall-/17850750/

the network. The city contacted AT&T-FirstNet, and a SatCOLT was deployed to the city and staged at the Whiteville Fire Department. The SatCOLT bolstered coverage in the area, which sped up data transmissions among first responders.

"We were the only municipality in our county, the third largest in North Carolina, that could actually communicate," said Hal Lowder, Director of Emergency Services for the City of Whiteville.

AT&T deployed other resources throughout the Carolinas in the aftermath of Hurricane Florence. Notably, the first drone-based deployable in the continental U.S. was launched in Wilmington, NC. The Flying COW tethered drone provided wireless connectivity to first responders as well as commercial customers impacted by Hurricane Florence.[22]

Super Bowl LIII

In addition to supporting first responders during natural disasters, FirstNet deployables are available to boost coverage during planned events, such as sports championships, music festivals, protests and demonstrations, and other events that attract large numbers of people. The capacity of commercial cellular networks is usually strained or overwhelmed by such events, as thousands of people try to use their mobile devices to talk, text, use email, share images, locate friends, post on social media, view news stories or information on the Internet, etc.

Because FirstNet is a network dedicated to public safety, police officers, firefighters, emergency medical technicians, and others who work at these events do not have to compete with users of commercial carriers to make calls and access and transmit data. And the use of deployables at very large events provides additional coverage and capacity if first responders need it, as well as redundancy and backup if the main network experiences problems.

In preparation for Super Bowl LIII in Atlanta in February 2019, AT&T-FirstNet took steps to ensure that FirstNet would be fully operational for the event. These included permanent enhancements to the network and deployment of Band 14 spectrum across the Atlanta area.

In addition, AT&T-FirstNet staged a SatCOLT outside the Mercedes-Benz Stadium, where the game was played. The deployable was intended as a safety net, to provide additional coverage and redundancy to first responders if they needed it. Officials reported that they did not need to put the deployable into service, but the upgrades to the FirstNet network proved valuable.

Warren Shepard, Manager at the Georgia Emergency Management Agency/ Homeland Security, attended the PERF forum in Atlanta and provided this example of how FirstNet was used to support an unanticipated communications need:

"The Georgia World Congress Center had contracted with a vendor to provide service for tethered drones during the event. They had an issue with their wireless provider. They weren't able to get a consistent signal, and they didn't have the bandwidth they needed to transmit images from the four drone cameras.

"We were able to reach out to the Georgia World Congress. We provided their vendor with the black (FirstNet) SIM cards, because it was for public safety. We were then able to monitor the drone feeds in the command post. So we had situational awareness of what was going on in and around the event for the Super Bowl."

22. "AT&T Deploys Flying COW," AT&T, September 25, 2018. Available at https://about.att.com/sites/hurricane_florence

Other Lessons from the Field

PERF's two regional FirstNet forums revealed other experiences of agencies using FirstNet deployables. Following are three lessons they have learned:

Build FirstNet deployables into disaster training and drills.

To help ensure that personnel know how to request and use a FirstNet deployable in an actual emergency, the Santa Clara County (CA) Fire Department tests those processes during drills. Recently, Santa Clara County had a countywide mobilization drill involving multiple public safety agencies. Fire Chief Tony Bowden described how the department practiced requesting FirstNet deployables in the drill, so that the process would be second-nature during a real incident.

"There are two ways to request a deployable—through the toll-free customer service line and also through our FirstNet principal consultant. For our countywide mobilization drill, we wanted to exercise these processes," Chief Bowden said. "In the first case, we gave the assignment to a captain in the fire station and said, 'Call this number and order this device for us.' This was somebody who had no background in communications or FirstNet. In the second case, we gave the assignment to another fire captain, who was a communications unit leader, and had him walk through the process with our FirstNet consultant. Both processes were pretty smooth, seamless and straightforward for us."

Because it was a drill, the Fire Department gave AT&T-FirstNet a 30-day advance notice for the deployable. Once the SatCOLT arrived, officials discussed where to best position it in conjunction with the incident command post.

After the drill, the Santa Clara County Fire Department was able to put practice into action. A fire in the Plumas National Forest required additional coverage for data and voice (push-to-talk) transmissions. A captain deployed as a communications team leader requested a FirstNet deployable, which arrived within the requested time frame of seven hours.

"The whole process with the drill was very smooth. It went as well as we could have expected for our first time deploying it," Chief Bowden said.

For planned events, get your deployable requests in early.

In January 2019, the San Francisco Bay Area hosted the College Football Playoff Championship Game. The game was held at Levi's Stadium, a 75,000-seat venue in Santa Clara, and a week of events associated with the game attracted large crowds to the region. Numerous public safety agencies were involved in developing and executing security plans.

In advance of the game, officials asked AT&T-FirstNet to evaluate the broadband network capacity at Levi's Stadium and in the surrounding area. Given the number of people who would be accessing commercial networks, public safety agencies wanted to ensure coverage for first responders. Based on its analysis, AT&T-FirstNet recommended that three FirstNet COWs be deployed to the region—two in the downtown San Jose area, and one near the stadium.

Andy Smith, Interoperability Manager for the City of San Jose, explained the process. "We asked for the evaluation a good 30 to 45 days in advance, and the local FirstNet team supported that for us," he said. "I think that moving forward, as we talk about large planned events or unplanned incidents, broadband is going to be a growing part of the incident command system. If you have a planned event, you want to get that coverage, so you should work in partnership with AT&T-FirstNet to evaluate the network ahead of time, so they can bring you COWs or other deployables as needed to support the event."

Consider acquiring your own deployables.

Some sophisticated FirstNet users have taken it upon themselves to acquire their own deployables that can be connected to the FirstNet network. One example is the Los Angeles Regional Interoperable Communications System (LA-RICS). This is a unified regional voice and data system providing interoperable communications and mobile capabilities for public safety responders in two dozen jurisdictions in Los Angeles County.

LA-RICS covers 10 million residents and 4,000 square miles of diverse terrain. (In 2018, LA-RICS transferred its assets of 76 Public Safety Broadband Network sites, and all the related towers, generators, and radio and network equipment to FirstNet.[23])

Using grant funds, LA-RICS purchased and outfitted nine Cell on Wheels (COWs) that can be deployed to incidents where extra capacity is needed or areas where broadband coverage is spotty. Scott Edson, Executive Director of LA-RICS, said the COWs are especially valuable for responding to fires and other major incidents.

"It took us three years to get there, but now, when we have a fire in a remote area where FirstNet coverage may be limited, we can roll the deployables," Mr. Edson said. "They are right behind the firetruck, and we can set it up quickly. Since LA County Fire is a FirstNet user, we can have our FirstNet service available almost immediately. So I encourage agencies to build their own deployables, especially if they have access to grant funds."

To further boost coverage in areas where fires are known to occur, LA-RICS has worked with AT&T-FirstNet and the U.S. Forest Service to expand the FirstNet infrastructure in the Angeles National Forest. "We identified areas where we know we have fires, and then we worked with the Forest Service and are building LTE sites in the forest. That was a huge accomplishment," Edson said.

Ryan Burchnell of AT&T-FirstNet said the Customer Owned And Maintained (COAM) program that allows agencies to purchase and operate their own deployables is part of the AT&T contract with the FirstNet Authority. He said the program continues to be refined, and some deployables for purchase are now undergoing testing. He said that any devices, including deployables, that will be connected to the FirstNet network have to

undergo rigorous testing at the FirstNet Authority's Innovation and Test Lab in Boulder, CO.[24]

Burchnell said that when agencies are thinking about acquiring their own deployables, coordination with the existing FirstNet radio access network is critical. "When you basically add another cell site to the network, how do we make sure that it's not interfering with what already exists?" he asked. "We have to make sure these assets are configured in the right way so they don't become a problem once they're turned on. But figuring that out is absolutely part of what we do at FirstNet."

Conclusion

Over the past two years, FirstNet has expanded across the United States. The Nationwide Public Safety Broadband Network is more than 80% complete and is supporting more than 1.5 million connections being used by more than 13,000 subscribing agencies.[25]

An important resource of FirstNet is its deployables program, which represents a collection of 76 mobile communications assets—both land-based and airborne. The deployables provide FirstNet users with increased network coverage, capacity, backup and redundancy during a variety of situations.

Over the past two years, FirstNet deployables have been called up during natural disasters and other unplanned events. Deployables have been especially helpful in major weather events such as hurricanes, which often knock out voice and data communications networks for public safety agencies as well as private customers. FirstNet deployables have also proven valuable during wildfires, which typically occur in national forests or other remote areas where the communications infrastructure may be sparse to begin with.

23. "LA-RICS Transfers Network Assets to AT&T in Support of FirstNet Nationwide Network Architecture," Los Angeles Regional Interoperable Communications System, News Release, July 2, 2018. Available at https://www.la-rics.org/wp-content/uploads/FINAL-LA-RICS-ATT-7.2.2018_FINAL-v2.pdf.

24. For more information about the FirstNet Innovation and Test Lab, visit https://firstnet.gov/network/innovation-and-test-lab.
25. Jackson, Donny, "FirstNet tops 1.5 million connections, 13,000 agencies, according to AT&T." *ICWE's Urgent Communications*, July 24, 2020. https://urgentcomm.com/2020/07/24/firstnet-tops-1-5-million-connections-13000-agencies-according-to-att/.

FirstNet deployables also have supported the public safety and medical response to the COVID-19 pandemic.

In addition, deployables can be valuable during planned events, such as major sports championships and festivals, which attract large numbers of people using their mobile devices, overloading commercial networks. In these situations, FirstNet deployables provide additional coverage, capacity and redundancy for first responders.

The FirstNet deployables program is a national initiative with a local focus. FirstNet users can request deployables 24 hours a day, seven days a week through their agency's AT&T-FirstNet representative or a dedicated customer-service line.

To promote efficiency and the quick deployment of assets, the deployables are pre-staged at secure locations around the country. The program is centrally managed by the AT&T-FirstNet Response Operations Group. This structure can provide a scalable response when additional coverage is needed. Several assets can be sent to a large event, or a single deployable can support a smaller event. Importantly, the program is designed to handle multiple events at the same time across the country.

FirstNet's investment in deployables is growing, especially for aerial assets, which can provide wider and more flexible coverage than land-based assets in some situations. FirstNet has added to its fleet three "flying COWs"—tethered drone-type devices that can stay airborne for more than 23 hours at a time—and the first aerostat (blimp), dubbed FirstNet One. In June 2020, the FirstNet Authority authorized millions of dollars in new spending to increase the number and variety of deployables available to public safety customers.

These additions will be important as the number of FirstNet users grows and the challenges facing public safety expand.

Related PERF Publications

Brazos County, TX Sheriff's Office: A FirstNet Early Adopter (January 2020): https://www.policeforum.org/assets/FirstNetBrazos.pdf

Beyond Signal Strength: Measuring Performance of Public Safety Mobile Broadband Networks (September 2019): https://www.policeforum.org/assets/FirstNetCaseStudy.pdf

The Revolution in Emergency Communications (November 2017): https://www.policeforum.org/assets/EmergencyCommunications.pdf