

# Communications, FirstNet, and AT&T

Communications Training



**WESTERN  
FIRE CHIEFS  
ASSOCIATION**



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## Introduction to Communications

Public safety agencies and responders use communications systems to transmit and receive critical data within their organization and during incidents – frequently including other departments, disciplines, and jurisdictions. Responders often use push-to-talk (PTT) devices such as land-mobile radio (LMR) systems or application-enabled smart devices (e.g., phones, tablets) that operate over cellular or long-term evolution (LTE) broadband networks. Broadband solutions are becoming a more common method of communications utilized along with LMR by public safety agencies.

Interoperable communications are an essential element of any emergency response activity; responders need to communicate with dispatch, members of their team, command or on-scene staff, and personnel from different disciplines, agencies, and jurisdictions. Jurisdictions generally make individual decisions about communications systems based upon factors such as mission scope, topography, population density, existing infrastructure, staff size, existing equipment/contracts, and in most cases budget as well. Deficiencies in interoperable communications have been highlighted in many after action reviews nationwide.

Historically, federal funding of organizations and development of communications interoperability standards were designed to address the challenges of communications interoperability. However, issues with communications interoperability remain a critical challenge to safe and effective emergency response.

### Public Safety Communications

Generally, responders would like the ability to communicate within their agency and with external partners (departments, disciplines, and jurisdictions) from the same device, regardless of carrier or band. This goal is often not a reality, and many agencies supply and carry multiple device types. There are three basic communication options used currently within public safety:

1. A “traditional” radio that operates on a conventional or trunked LMR network. These systems are primarily built for voice communications and offer limited functionality for the transfer of other data types (images, video, files).
2. A device (smartphone, tablet) used on the FirstNet network. These systems allow the communication of multiple data types (including voice, images, video, and data files), and subscribers have priority and preemption within the network. Additional functionality is available through application-based services (PTT, live-streaming).
3. A device (smartphone, tablet) through another LTE broadband carrier.

Many jurisdictions own and maintain devices needed to operate on both LMR and LTE communications networks due to costs, topography, existing infrastructure, and other factors. These interoperability gateways are only designed for voice communication. In addition, there are nation-wide interoperability channels, but agencies do not usually have the staff or capability to program or access these channels.

Furthermore, there is no universal encryption and decryption schema; this is simply not a viable solution given the differing needs, budgets, and constraints of the tens of thousands of public safety agencies in the United States.

### Project 25 (P25)

P25 is a set of standards for public safety LMR systems that are intended to ensure interoperable communications regardless of the manufacturer of the equipment. The P25 standards cover infrastructure and interfaces, subscriber equipment, and features and functions. To this day, LMR systems may or may not be P25-compliant based on priorities and/or budget. Further, these standards do not address cellular or broadband-based systems.

## First Responder Network Authority (FirstNet)

The FirstNet Authority is an independent government agency established in 2012 by Congress to build a public safety broadband network to provide a dedicated communications capability for public safety personnel on cellular and broadband-based systems. This network was to use Band 14 – a dedicated 20MHz band within the 700MHz frequency of the broadband spectrum – to provide this service. A number of companies bid on the opportunity to build the network and AT&T was awarded the contract in 2017. This contract started a unique 25-year public-private partnership to build, maintain, and support the FirstNet network. The FirstNet core is built on a 5G/4G LTE network that can access Band 14 and other commercial bands. The FirstNet Authority is tasked with monitoring the buildout and maintenance of the public safety network built by AT&T and holding them to the requirements of the contract. To truly design a network for public safety by public safety – a distinction that makes it unique in American telecommunications history – the FirstNet Authority continuously consults with local, state/territory, tribal and federal public safety agencies across the country.

### General Coverage

FirstNet wireless broadband coverage reaches more than 99 percent of the American population using AT&T as the carrier. When the network is fully built out it will extend coverage to 2.74 million square miles, covering 76.2 percent of the continental United States. FirstNet provides the same services, support, and capabilities that are provided on the mainland to public safety responders in Hawaii and Alaska and the U.S. territories.

Coverage and capacity continue to expand where first responders need it most. Sites are constructed using the FirstNet Band 14 spectrum, as well as other spectrum bands in the AT&T commercial spectrum portfolio. The FirstNet network is based on a unique hybrid of shared AT&T and dedicated FirstNet assets, supported by billions of dollars invested in people, processes, systems, and equipment designed to provide customers with the first nationwide, dedicated public safety LTE network.

In addition to building out a network to ensure comprehensive coverage, FirstNet continues efforts to improve availability and resiliency. Agencies might need to augment network coverage during emergencies to communicate and send data, and the same need might exist during planned events that draw large crowds to a single location. FirstNet can provide needed network access to coordinate public safety resources and respond to any incident – planned or unplanned.

### FirstNet Subscription

To get the benefits of FirstNet services you must be a subscriber using a FirstNet-Ready device. FirstNet is exclusively for first responders and select other entities– law enforcement, fire protection, emergency (911) call dispatching and government Public Safety Answering Points, emergency planning and management offices, and emergency medical services. Other essential personnel who support first responders before, during and after an emergency can also subscribe to FirstNet – for example, organizations that provide medical care, mitigation, remediation, overhaul, clean-up, restoration, or other such services during or after an incident.

Qualified agencies should reach out to their local FirstNet Solutions Consultant (FNSC) to inquire about the available features and to subscribe to the service. Individuals may also subscribe to FirstNet on a personal account provided they qualify under specific first responder roles. Service and account management is available to both agencies and individuals through a dedicated portal referred to as FirstNet Central.





**Satellite Cell on Light Trucks (SatCOLT)**

## Augmenting FirstNet Coverage

Deployable Fleet – To address temporary coverage requirements at both emergent and planned events, FirstNet has a fleet of more than 150 deployable assets. The fleet includes those listed to the left.

During emergency situations or planned events where and when temporary coverage might be required, FirstNet will triage all requests, and when needed, provide the solution within the contract-specified Recovery Time Objective (RTO) at no cost to the agency.

## Enhancement Tools

FirstNet has also developed a host of tools available for enhancing connectivity outside of the response oriented deployable fleet. These tools include:

- Cellular repeaters, which extend an existing outdoor signal to an indoor location with otherwise no connectivity
- Customer ability to own and deploy their own Band 14 LTE equipment through the purchase of a Compact Rapid Deployable (CRD)
- FirstNet Mega-Range, which uses specially designed modems that operate at a higher power class on Band 14 to improve throughput on cell towers and ultimately boost connectivity in remote areas or inside buildings.



**Drone-based Cell on Wings (Flying COW)**

First Net Devices – FirstNet offers an extensive selection of devices and accessories that are FirstNet Ready. This designation ensures that the device will operate with the required FirstNet SIM card and provide the expected features of the network.

Users have access to an expansive catalog of LTE devices from most major brands, including:

- Smart phones and devices
- Tablets and laptops
- Smart watches



**Compact Rapid Deployables (CRDs)**



**An Aerostat (FirstNet One)**

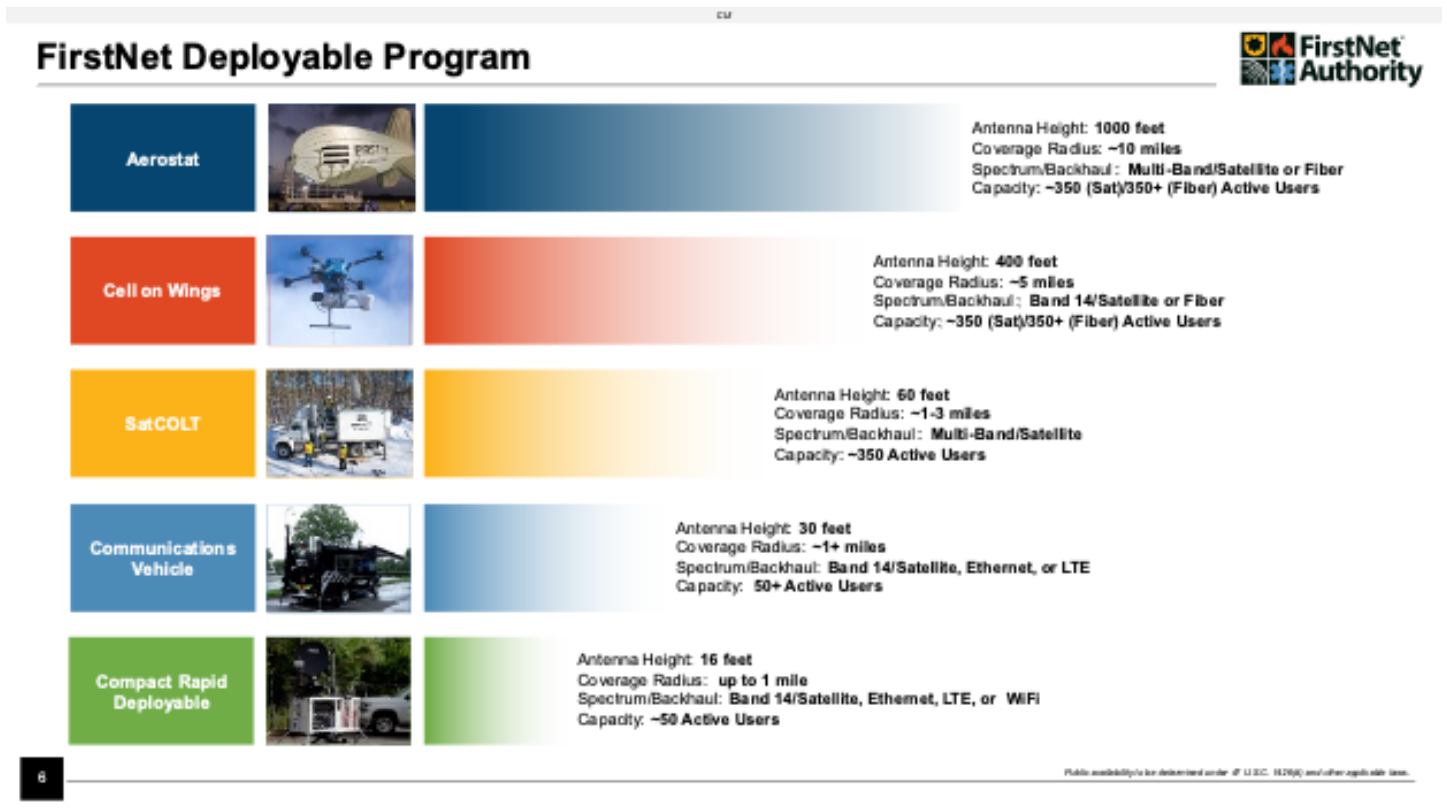
## First Net Deployable Asset Program

Band 14 connection is provided through FirstNet deployable assets for the best public safety experience. Agencies that subscribe to FirstNet can request deployables for disasters, critical incidents, and planned events at no cost. All expenses directly associated with FirstNet deployables are covered by FirstNet including fuel, personnel, and satellite backhaul. SatCOLTs are distributed strategically throughout the US and once deployed arrive on scene within the contractual Recovery Time Objective. The fleet of FirstNet deployables may also be supplemented by other AT&T deployable assets where and when necessary.

Coverage provided varies by terrain and other factors but can be up to several miles, and there may be cases where more than one asset is deployed in order to provide the required coverage. The data delivery is typically through a satellite backhaul, which has a much smaller capability than land based backhaul, so capacity and speeds are at times limited as compared to normal land-based coverage. Users that are used to a land-based delivery system such as fiber broadband should be reminded of this, and activities such as video streaming should be limited to mission critical operations. FirstNet deployable assets are typically configured to restrict access to devices with FirstNet SIMs, so use by other devices and carriers is not generally possible. Use of WiFi hotspots and routers connected to SatCOLTs is possible, but further introduces potential lack of visibility of who is using network resources and in what manner.

### Types of Deployable Assets and their Capability

The types of deployable assets range from the FirstNet One Aerostat to a Compact Rapid Deployable (CRD). Basic characteristics and capabilities are in the chart below.



## Requesting a Deployable Asset

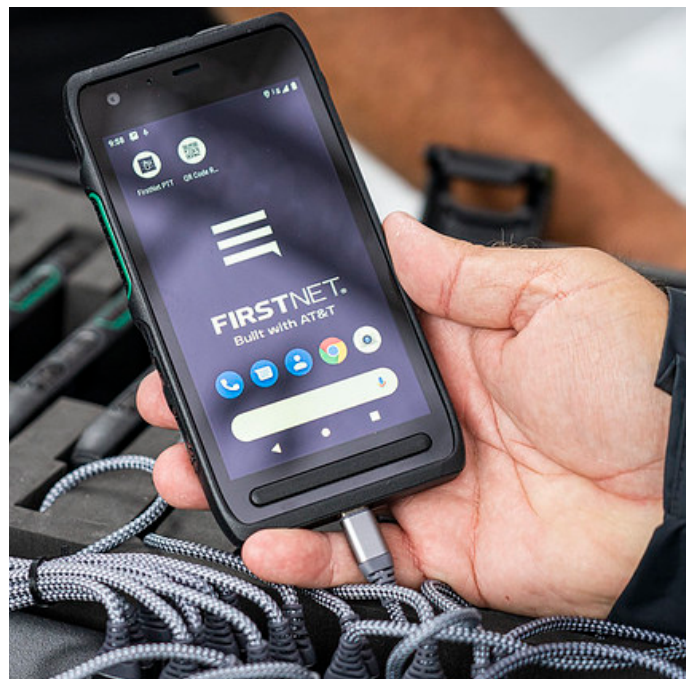
Ordering of a FirstNet deployable solution should only commence after an IC (or Communications Unit Leader {COML} in consultation with an IC) approves of the order. Any FirstNet subscriber agency can request a deployable asset by direct interaction with their FirstNet liaison, using the Online Request tool within **FirstNet Central** (<https://firstnetcentral.firstnet.com>) or by calling **FirstNet Customer Care - 1-800-574-7000**. Having the agency's Foundation Account Number (FAN) can be helpful to verify the customer and speed the process when calling the helpdesk, but it is not required. The Online Request tool is only available on FirstNet Central to users whose accounts are designated an Agency Administrator or Uplift Manager. Do not assume support was requested on your behalf as incidents are often complex and information may not be well shared during early phases – discussing a request with a FirstNet representative does not equal an actual request until a form is submitted.

The caller should also be prepared to provide some basic information when talking to the helpdesk, which can be done verbally or using a form that can be attached to an email. The types of information that will be helpful to ensure the best solution includes the following:

- Specify the problem being faced that is causing a deployable to be requested.
- Identify the locations where coverage is needed and the possible incident geographic size.
- Approximate the number of expected users and number and types of devices (remember every user could have multiple devices).
- Desired type of services – voice calls, text messaging, e-mail, apps, data connectivity, send/receive still images, send/receive video, app use, web browser, sensors, video feeds, etc.
- Possible environmental concerns – heat or cold, high winds, other potential hazards.
- Roadway status – steep inclines or sharp corners, pass-ability, bridge restrictions, wash-outs and crossings, etc.
- Name of the incident, location of ICP, point-of-contact (POC – exchange of contact info)
- Desired time for delivery
- Name of the Incident Commander/Authority having jurisdiction (AHJ)

The caller should not pre-specify a solution – rather, they should expect to give information that will allow the FirstNet Response Operations Group (ROG) to determine the best solution for the specific needs. As such, the caller should call FirstNet Customer Service as soon as they have any hint of an anticipated need. It is useful if the caller can be reachable after making the call, as the ROG may need to make follow-up calls to obtain additional details, ask other questions, plan arrival/site access/setup, etc. . Requesters using the online request tool should provide the same information.

Always make requests for FirstNet deployable assets for planned events as early as possible but no later than 30 days in advance.



## Recovery Time Objective (RTO)

The RTO requirement is 14-hours in all states except for California (7 hours) and Kansas (10 hours). The RTO is calculated from the time the initial customer request is logged until the asset is on-air. For the purpose of RTO, events are classified into one of the following categories:

- **Emergent** – An emergency request for a solution requiring immediate attention and resolution within the RTO.
- **Urgent** – A short-notice (non-emergency) request for a solution where the response time is not bound by the RTO (at the customer's request) and the resolution may either be "best-effort" or on a specific date (inside 30 days) as coordinated with the customer.
- **Planned** – A request for a solution for an event occurring 30 days or more in the future.

If the solution is a repeater or a small cell, the equipment will be shipped to the local market and installation will be coordinated with the customer/requestor.

If the solution is a SatCOLT, the asset will be assigned a crew and will depart the identified storage facility as soon as practical in order to meet the RTO.



## Placement of FirstNet Deployable Assets

If a deployable asset is requested, there are certain expectations that will need to be ensured prior to delivery. In general, larger FirstNet deployable assets need a level and clear area of about 100' x 100'. In addition, the site must be selected so that there is clear and unobstructed view of the southern horizon.

## Security and Maintenance of FirstNet Devices

When there is a need to move a deployable asset to a new location it should be addressed with a new request for support. This should be coordinated with the designated FirstNet Liaison. In general, SatCOLTs should be placed where their security can be reasonably assured. It is not necessary to provide dedicated security unless deployed to a location where physical damage from the public without it is deemed possible. It is important to provide to your FirstNet point of contact as early as possible any plans to move or abandon camp so that the asset is not left unattended. Refueling is the responsibility of FirstNet, however, if the primary unit and backup generator can be included into any existing refueling plans, that is appreciated.

## Transfer of Command and Demobilization

It is critical to ensure the integrity of the service and the asset that replacement staff and the FirstNet Liaison are kept aware of any changes in requirements, operations or movements that may affect the deployment. When swapping out teams, it is critical that the presence and use of the deployable assets be discussed and documented. Coordination between teams and with your FirstNet Liaison can help decide what should be done if an arriving team determines they have no need for the asset (i.e. they have no subscribers). There is no one answer as to whether the asset should stay or be removed.

Deployable assets should be demobilized once the mission is complete at a particular location and/or it is otherwise certain that there is no further need. The decision should be clearly coordinated with the IC and all FirstNet users. The COML or IC should contact the FirstNet Liaison and provide the condition of the location (i.e. populated, abandoned, in danger) for the following 2-3 days. The ROG Team can then determine the right timing for the demobilization.



## FirstNet Deployable Follow-Up

The FirstNet deployable program has been utilized in steadily increasing numbers over the first four years. FirstNet Authority may consider expansion of the FirstNet fleet of deployables to enhance response for public safety during emergencies and events however, it is important to keep in mind that FirstNet is intended to promote a program that is designed for public safety professionals, by public safety professions. With that in mind, feedback is encouraged and essential. It is useful to let your FirstNet state contact know your experience if you use a deployable. Further, after a SatCOLT deployment, the FirstNet Authority can conduct a Post Incident/Event Review with your agency to discuss deployment results and document lessons learned.

## FirstNet Partnership and Programs

Preparedness – FirstNet Authority provides three types of support for subscribers that are especially helpful to emergency managers and public safety agencies as they prepare for all hazards:

- **Pre-planning support** – First Net can meet with public safety agencies preparing for impending disasters or planned events to understand the scope of the event, identify priority locations where broadband communications are needed, and determine the broadband capabilities and technologies public safety will use at those locations. Information from this evaluation will be documented and provided to AT&T to use in determining the right solution to support the event (i.e., hurricanes, major sporting events, etc.).
- **FirstNet Inject Catalog** – This comprehensive searchable tool is designed to help emergency planners integrate broadband capabilities into discussion-based (tabletop) and operational (functional and full-scale) exercises. Available to all public safety agencies at no cost, the catalog offers more than 800 realistic situational injects and associated questions that will exercise your responders' and agency's broadband capabilities and procedures. The catalog is organized inject type (discussion or operationally based), task type, or technology type.
- **Post-incident reviews** – When requested, the FirstNet Authority can facilitate a discussion to work through a series of questions capturing successes, challenges, best practices and lessons learned about the deployment of FirstNet assets and the services provided.

## FirstNet Central

FirstNet Central is a centralized dashboard for FirstNet customers to manage their dedicated FirstNet services, which provides tools to aid situational awareness and operations. The Network Status Tool allows users to view current network outages and to set alerts for notification of unplanned network outages in the future. The FirstNet Uplift Request Tool can be used to provide temporary elevation of users such as utilities and infrastructure managers to the same priority level as a public safety user.

## Response Operations Group (ROG)

The ROG serves as the entry and coordination point for resource mobilization of deployable FirstNet solutions and supports all public safety requests for emergent, urgent and planned coverage augmentation. To seamlessly communicate with public safety, the group is organized in accordance with and operates under National Incident Management System (NIMS) principles – Section Chiefs are assigned specific geographies and are responsible for all deployments in their area. Tickets created from calls for support are immediately forwarded to an on-call team consisting of appropriate subject matter experts across AT&T/FirstNet. All requests are fully triaged to determine the most appropriate solution which may include but are not limited to deployment of any of the following: small cell equipment, Band 14 repeater, Mobile Broadband Kit (MBK), Compact Rapid Deployable (CRD) or Satellite Cell on Light Truck (SatCOLT), or a generator in cases where the availability of commercial power is the only issue.

## Useful Links

FirstNet Built with AT&T: <https://www.firstnet.com/>  
FirstNet Deployable Assets: <https://www.youtube.com/watch?v=Azu52hjUB8A>  
CRD Demo & Walk-around Tour: <https://www.youtube.com/watch?v=TimOZ0jxHEQ>