

# Site Visits Report

## Emergency Disaster Relief Program Years 2021, 2022 and 2023

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### NETWORK PERFORMANCE AND PUBLIC SAFETY

Communications Service Providers Network Resiliency Requirements in Tier 2 and 3 High Fire Threat Districts pursuant to Decisions (D.) 20-07-011 and (D.) 21-02-029

Prepared by: Communications Division

October 1, 2024



**California Public  
Utilities Commission**

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# Introduction and Background

## Introduction

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This Site Visits Report (“Report”) presents the Communications Division’s (“CD”) findings, observations, and recommendations resulting from one hundred eighty-six (186) individual facilities (“sites”)<sup>1</sup> visited in 2021, 2022, and 2023 by CD’s Senior Telecommunications Engineers (“Engineers”) to examine communications service providers’ compliance with the California Public Utilities Commission’s (“CPUC” or “Commission”) Emergency Disaster Relief Program (“EDRP” or “Program”) established in Rulemaking (R.) 18-03-011.<sup>2</sup>

This Report is intended to aid the Commission and the public in understanding the resiliency of California’s communications networks to ensure public safety. Thus, the information contained in this Report is general in nature, referencing and summarizing information that wireless and wireline service providers submitted to the Commission with requests for confidential treatment of their individual reports and site visits pursuant to General Order (G.O.) 66-D.

## Background

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The Commission’s **Emergency Disaster Relief Program** (“Program”) applicable to communications service providers is set forth in two decisions (collectively referred to as “EDRP Decisions”):

1. (D.) 20-07-011 for wireless service providers<sup>3</sup> adopted on *July 20, 2020*,
2. (D.) 21-02-029 for wireline service providers<sup>4</sup> adopted on *February 18, 2021*.

The EDRP Decisions require facilities-based communications service providers (service providers) to prepare for natural disasters, wildfires, extreme weather conditions, and power outage events such as Public Safety Power Shutoff (“PSPS”).<sup>5</sup> Service providers with network infrastructure in California’s Tier 2 and 3 High Fire Threat Districts<sup>6</sup> (“HFTD”) must develop comprehensive

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<sup>1</sup> The terms “facilities” and “sites” are used interchangeably in this Report.

<sup>2</sup> See [R.18-03-011](#), and [Communications Network Resiliency](#) webpage.

<sup>3</sup> See [D.20-07-011](#), Ordering Paragraphs (OPs) 1 & 3, at pp. 143-146.

<sup>4</sup> See [D.21-02-029](#), OPs 1 & 5, at pp. 101-103.

<sup>5</sup> See Public Safety Power Shutoff (PSPS) information on CPUC website: [Wildfire and Wildfire Safety \(ca.gov\)](#).

<sup>6</sup> See Tier 2 and 3 High Fire Threat Districts (HFTD) information and maps on CPUC website: [Fire-Threat Maps and Fire-Safety Rulemaking \(ca.gov\)](#).

network resiliency strategies to ensure its customers maintain a minimum level of coverage and service to preserve access to 9-1-1, 2-1-1, and internet browsing for emergency information.

### Resiliency Strategies

The CPUC adopted six groups of resiliency strategies for wireless and wireline service providers in the EDRP Decisions:

- a. Implement 72-hours of backup power to support essential communications equipment and minimum service levels for the public (72 hours is considered to be “sufficient backup power” for purposes of this Report).
- b. Build and maintain redundant communication networks.
- c. Harden communications networks to withstand damage.
- d. Restore service to damaged or destroyed facilities. Use temporary facilities (mobile cell sites, mobile satellite, and microwave backhaul, etc.).
- e. Establish communication and coordination processes with first responders, other public utilities, the Commission, and the public; and
- f. Establish emergency preparedness planning for employees and ensure sufficient staffing levels.

Figure 1: Six Resiliency Strategies



## Service Provider Annual Data Submittals (“Plans”)

Pursuant to the EDRP Decisions, service providers are required to submit Communications Resiliency Plans and Emergency Operations Plans to the CPUC on an annual basis. These two annual submittals will be referred to as “Plans”<sup>7</sup> throughout this Report. The “Plans” contain network facilities data which informs the CPUC about how service providers are complying with the Ordering Paragraphs of the adopted EDRP Decisions and whether service providers are maintaining resilient networks in California.

- **Communications Resiliency Plans** contain specific location data and other detailed information about each facility located in Tier 2 and 3 HFTD. Wireless service providers must submit Communications Resiliency Plans in January; wireline service providers must submit Communications Resiliency Plans in August.
- **Emergency Operations Plans** contain the service provider’s company’s emergency operations plans, emergency contact information, an emergency preparedness attestation, and its public communications plan. Wireless service providers must submit Emergency Operations Plans in September; wireline service providers must submit Emergency Operations Plans in April.

Staff use the data submitted by service providers in the Plans along with emergency disaster and PSPS events reported in Disaster Event Data Requests<sup>8</sup> to identify a small sample of sites to visit from the approximately 21,000 sites<sup>9</sup> located in the Tier 2 and 3 HFTD of California.

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<sup>7</sup> For [wireless](#) and [wireline](#) Communications Resiliency Plan templates and Emergency Operations Plan (EOP) annual reporting requirements, see CPUC website [Communications Network Resiliency](#).

<sup>8</sup> The CPUC collects network outage data as part its [Disaster Event Data Request](#) process.

<sup>9</sup> Pursuant to the EDRP Decisions, wireless and wireline service providers are required to submit Communications Resiliency Plans and Emergency Operations Plans annually to the CPUC. Communications Resiliency Plans contain information about approximately 21,000 facilities in Tier 2 and Tier 3 HFTD. Summary of facilities can be found at [Communications Network Resiliency](#).

# Function of Site Visits

## Purpose and Benefits of Site Visits

Site visits are in-person or virtual meetings led by CPUC Senior Engineers and attended by a service provider's designated representative at one or more of its network facilities and generator storage warehouse locations in Tier 2 and 3 HFTD areas.

Site visits provide opportunities for Staff to examine individual network facilities for compliance with the six resiliency strategies adopted in the EDRP Decisions, assess the implementation of the service providers' Plans, and check the accuracy of data that service providers submit to the CPUC.

While the purpose of each site visit is to assess the facility's capacity for 72 hours of backup power, the presence of transport redundancy, and the hardening and implementation of the resiliency strategies at the site overall, there are additional benefits derived from site visits.

Additional benefits of site visits include:

- Providing in-person opportunities for collaborating and building rapport with service providers,
- Exposing Engineers to the most current technological advancements that service providers are implementing in their communications networks,
- Exploring alternative energy solutions for backup power such as solar, compact and high-capacity batteries, and hydrogen fuel cell batteries,
- Demonstrating to service providers that the CPUC is committed to network resiliency and the delivery of reliable communications services to Californians.

## Site Visits Implementation

Staff initiated site visits in 2021 to examine service providers' implementation of the network resiliency strategies adopted in EDRP Decisions that established the **Emergency Disaster Relief Program** in R.18-03-011. Engineers have visited a total of one hundred eighty-six (186) sites thus far over the three years of this Program.

Staff prioritize site visits to facilities that are reported by services providers as lacking 72 hours of backup power due to a safety risk or because of providers claims that sites are infeasible and impossible to implement backup power at certain locations.

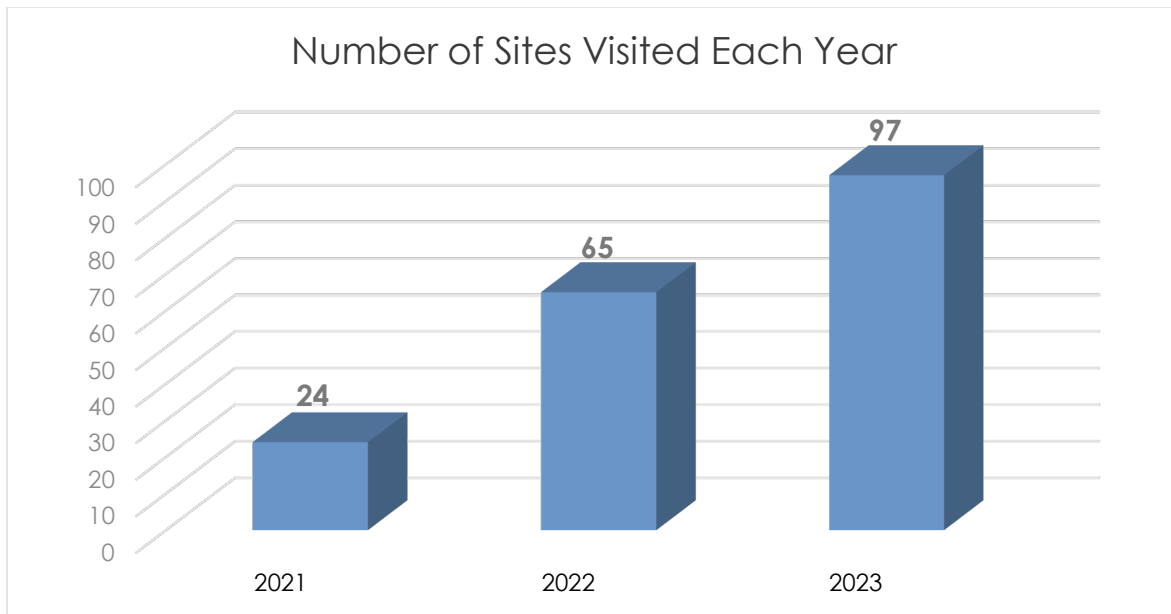
During these early years of Program implementation, Staff focused on visiting sites in HFTD areas that had been hit hard by devastating wildfires. The health and safety of site access as well as a site's proximity to CPUC offices were additional considerations for selecting sites to visit in 2021 and 2022 due to the COVID-19 pandemic.

Staff have since increased the number of sites visited year-over-year. See Figure 2 below for the number of sites visited in 2021, 2022, and 2023.

Site visit selection criteria expanded in 2023 to include sites reported as having long outage durations in actual emergency situations. Engineers also visited sites in 2023 that service providers reported were equipped with 72-hours of backup power. The purpose of these site visits was to examine the emergency preparedness of the backup power as reported by service providers.

- Engineers visited sites with fixed generators to assess conditions of the generators and whether their fuel capacities met the requirements of 72 hours of backup power.
- Engineers also visited sites using mobile generators for backup power to ensure the site was equipped with a “hook-up” connection, such as a Camlock or Appleton Plug.

Figure 2: Number of Sites Visited in 2021, 2022 and 2023





# Methodology

## Site Selection Criteria

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The sites that are selected to visit are chosen from the following criteria:

- Located in a Tier 2 and 3 HFTD,<sup>10</sup>
- Lack 72 hours of backup power due to safety risk or were identified in service providers' Plans as infeasible to implement backup power,
- Reported as having 72 hours of backup power to verify reporting,
- Impacted by disasters, emergencies and PSPS events,
- Have fixed generators installed to examine tank capacity and refueling plans,
- Identified as mobile generator storage locations to examine for deployment readiness,
- Representative sample that includes all types of service providers in a variety of areas across the state. The sample also includes varied types of facilities deployed by providers.<sup>11</sup> For example:
  - **Wireless** facilities may include:
    - Macrocell (Coverage/Capacity)
    - Small Cell
    - Distributed Antenna System (Indoor/Outdoor)
  - **Wireline** facilities, may include nodes, remote terminal unit (RTUs) and central offices,<sup>12</sup>
- Explore technological developments or examine issues identified in the annual data submitted to the CPUC.

For more information about the types of wireless and wireline facilities listed above, see the Glossary in this Report. See also Appendix B for basic illustrative examples of infrastructure designs that service providers might deploy in communications networks.

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<sup>10</sup> Engineers determined that one site visited was located Tier 1 due to an error in a service provider's Plan.

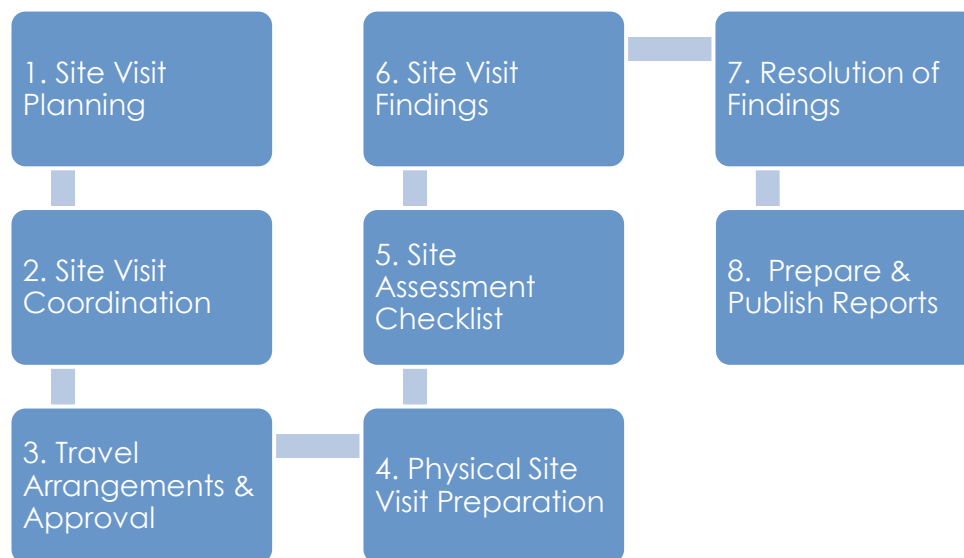
<sup>11</sup> See Glossary and Appendix B in this Report for more information on the types of wireless and wireline site designs that might be deployed as part of communications network infrastructure.

<sup>12</sup> Central office: Main switching facility for a communications service provider.

## Site Visit Process

There are multiple steps involved in planning and conducting successful site visits. See the eight (8) process steps depicted in Figure 3 below.

Figure 3: Process for Planning and Conducting Site Visits

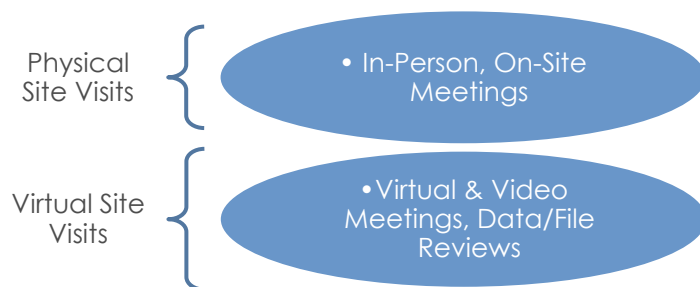


### 1. Site Visit Planning

Staff determine which visits will be conducted physically in the field and which will be virtual. Most site visits are conducted by physical site visit at the facility location; however, a virtual “visit” may be proposed in lieu of an in-person visit by Engineers due to site-specific safety concerns. Examples of site-specific safety and liability concerns include the lack of wireless communications coverage, the threat of inclement or extreme weather, or because special gear is required to access the facility.

If a visit is to be conducted virtually, Staff request the service provider’s designated representative be available at the site, if possible, and conduct a live video visit while the Engineer leads the service provider virtually through the Site Assessment Checklist. Results of the virtual review are documented and communicated back to the service provider in a similar manner to physical (in-person) site visits.

Figure 4: Types of Site Visits



## 2. Site Visit Coordination

Staff coordinate physical site access with service providers and request video calls and data files for virtual site visits. Every network site location is as unique as the host property on which it is installed. Some facilities may be accessible via the public right-of-way while others are more secure and require advance clearance to access.

## 3. Travel Arrangements & Approval

CPUC procedures require that cost-effective travel arrangements are made well in advance after discussing with a supervisor. The travel plan must be submitted at least 10 days prior to the travel date and must be fully approved and reimbursement reports must also be completed within 30 days upon returning from site visits.

## 4. Physical Site Visit Preparation

Engineers ensure the availability of equipment prior to traveling to a site such as personal protective equipment (PPE), camera, navigation, or paper map, safety gear, testing equipment, all-wheel drive vehicle, and printout copies of the Site Assessment Checklist.

## 5. Site Assessment Checklist

The Site Assessment Checklist (Checklist) guides the examination of the facility and creates a signed record of each site visit. The Checklist is used for both physical and virtual site visits alike. (See [Appendix A.](#))

The Checklist facilitates discussion about the condition of the facility and identifies what, if anything, is needed to bring the facility into compliance with Decision rules. Staff obtain permission from the service provider's representative to capture photographs of the facility and its surroundings.

The Engineer and the service provider's representative in attendance sign and retain copies of the completed Checklist which is also used by Staff to follow-up with the service provider about the

status of correcting any issues or problems identified during the site visit. Service providers request confidential treatment of the information contained in these Checklists pursuant to G.O. 66-D.

## 6. Site Visit Findings

Staff create files within the CPUC system drives to document every site visit conducted. Staff manually enter data into various tracking spreadsheets and workbooks to capture observations, findings, and recommendations, and to track correspondence with service providers regarding issues or problems that required follow-up.

In addition to uploading signed Checklists and associated facility photographs, Staff create and upload a Site Visit Summary (Summary) for each site visit. This one or two-page Summary is an internal report that captures a description of the key findings identified by Engineers during the site visit, relevant photographs, and a list of any corrective actions needed for the facility to comply with the Decision rules.

Note: Summaries, Checklists, and spreadsheets contain site location details and service provider representative information and are therefore kept confidential.

## 7. Resolution of Findings

Staff immediately begin the follow-up work with service providers to resolve issues found during site visits and document this outreach in various tracking spreadsheets. These spreadsheets support the tracking and resolution of outstanding corrective actions with service providers as well as feed metrics into various presentations and reports completed throughout the year.

## 8. Prepare & Publish Reports

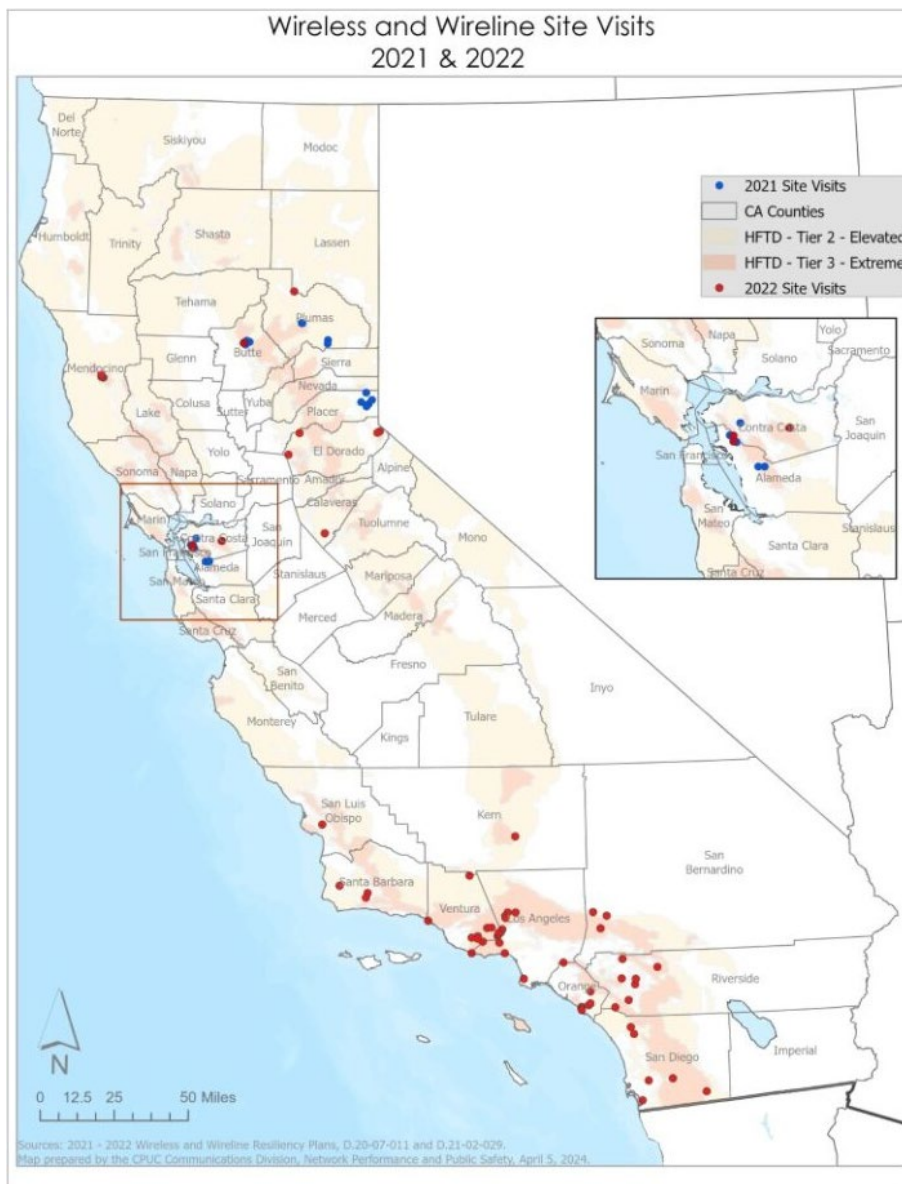
Staff prepare reports that provide details about the site visits conducted as well as the key observations, findings, and recommendations made by the Engineer(s) for each site visited.

# Sites Visited in 2021 and 2022

## Overview

Staff initiated site visits under the Emergency Relief Disaster Program in 2021. Engineers visited twenty-four (24) sites in the year 2021 and sixty-five (65) sites in 2022. See Figure 5 below for a general state map of the eighty-nine (89) total sites visited in 2021 and 2022.

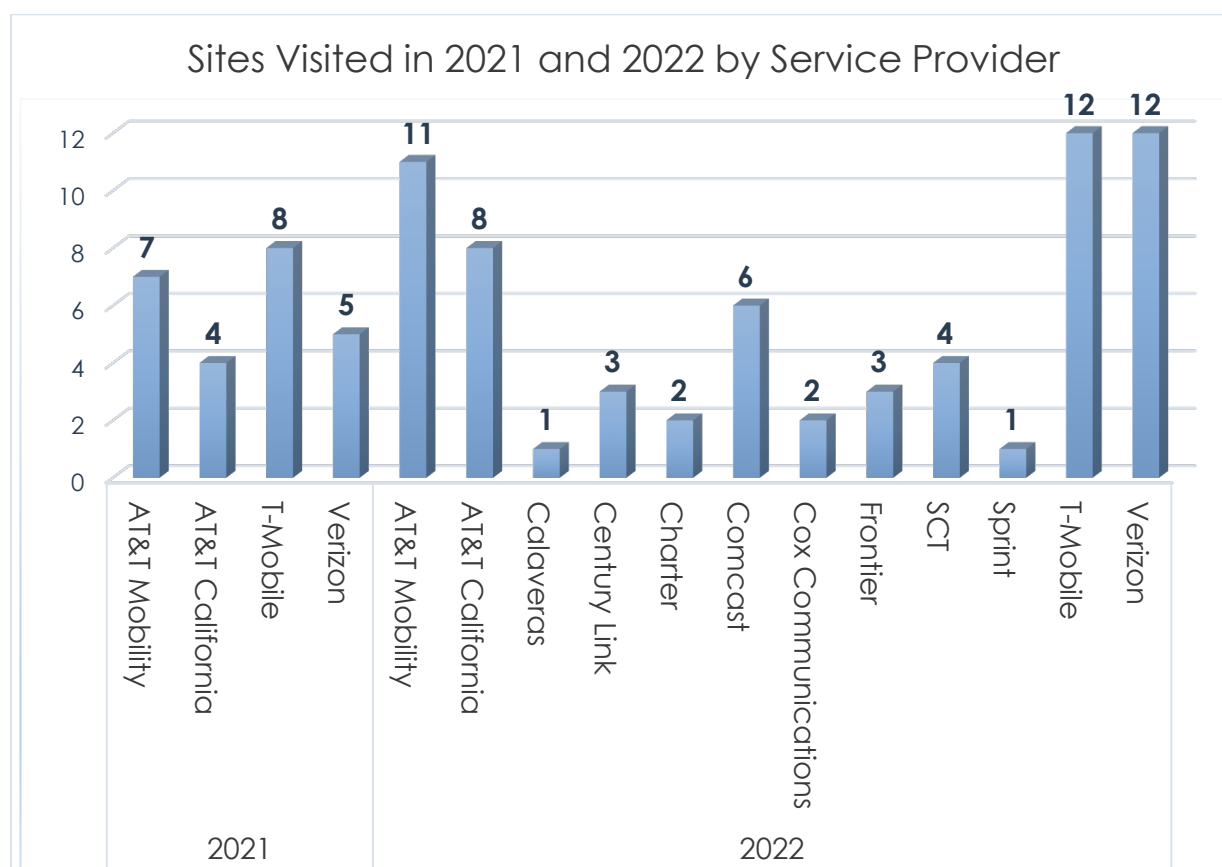
Figure 5: Sites Visited in 2021 and 2022



See Figure 6 below depicting the number of sites visited in 2021 and 2022 by service provider.

Staff increased the total number of service providers’ sites visited from twenty-four (24) in 2021 to sixty-five (65) in 2022, which included a near doubling of the number of wireless site visits. Staff increased focus on wireless facilities in 2022 because Plans filed by wireless service providers indicated that a significant proportion of wireless facilities lack 72 hours of backup power.<sup>13</sup> This is particularly concerning given that customers and first responders<sup>14</sup> rely on wireless communication services for access to 9-1-1, 2-1-1, emergency alerts and notifications, and basic internet.

Figure 6: Sites Visited in 2021 and 2022 by Service Provider



<sup>13</sup> Summary of facilities can be found at [Communications Network Resiliency](#).

<sup>14</sup> Section 6.4.6 of Wireless Resiliency Decision, D.20-07-011, at p. 92.

## Sites Visited in 2021

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In 2021, Engineers visited sites in the counties of Alameda, Butte, Contra Costa, Placer, and Plumas. Of the twenty-four (24) total sites visited in 2021, the Engineers found that only six (6) of them had sufficient backup power to comply with the EDRP Decisions. Thus, eighteen (18) sites were found to be lacking sufficient backup power, and one (1) of these eighteen (18) sites had no backup power at all. The other seventeen (17) sites relied solely on batteries for their backup power, leaving each of these facilities with less than eight (8) hours of backup power.

Staff asked the service providers responsible for the eighteen (18) sites lacking sufficient backup power to install either fixed or mobile generators. Staff also recommended to service providers that they install the “hook-ups” necessary to readily connect to mobile generators and to ensure their generator refueling schedules were designed to meet the 72 hours backup power requirement.

As a result of these site visits, service providers made some resiliency-related improvements. Staff analyzed service providers’ Plans submitted in 2023 to determine whether any resiliency improvements were made to the sites visited in 2021 that had been found to be lacking sufficient backup power at the time of the site visit. See the ‘before-and-after’ depiction of network resiliency improvements in Figure 7 below. Service providers reported improvements in their 2023 Plans indicating the addition of seven (7) fixed generators and the assignment of seven (7) mobile generators since the 2021 site visits.

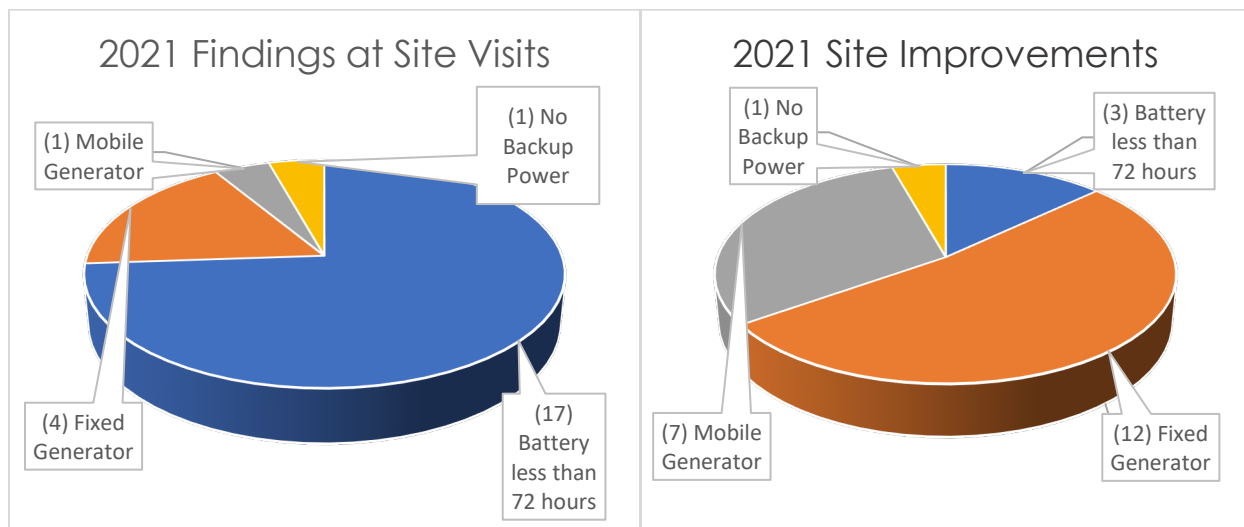
Four (4) sites visited in 2021 continue to be non-compliant<sup>15</sup> with the EDRP Decisions. Two (2) of the four (4) are installed on utility poles in the right-of-way. These two (2) sites in the right-of-way have battery backup power installed ranging from 4.5 to 11 hours, but the physical space on or around these poles does not appear to be readily available for additional batteries. One (1) is an iDAS with approximately four (4) hours of battery backup, only operational when open to the public, and the last one (1) site continues to have no backup power due to unresolved challenges with limited physical space.

Staff will continue to monitor this situation, reminding all service providers of other strategies, such as network redundancy and centralized power hubs, so that facilities within the network will be resilient regardless of the specific challenges at each location.

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<sup>15</sup> This Report does not include data from 2024 annual Plans.

Figure 7: 2021 Site Visit Findings by Type of Backup Power\*



\*Figure 7 depicts a subset of key data points related to the site visited; for illustrative purposes, some data points are omitted (i.e. visits to warehouses were omitted.)

## Sites Visited in 2022

Engineers expanded the geographical footprint of sites visited in 2022 to include Southern California and increased the number of sites visited to sixty-five (65) sites that year.

Sites that Engineers visited in 2022 were in the counties of Alameda, Butte, Calaveras, Contra Costa, El Dorado, Kern, Mendocino, Los Angeles, Orange, Plumas, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura.

Engineers found that forty-four (44) of the sixty-five (65) sites visited did not have sufficient backup power at the time of the site visits. Specifically, thirty (30) sites had less than 72 hours of battery backup power, and fourteen (14) sites had no backup power at all. Staff recommended that providers install fixed generators or camlock connections for hooking up to mobile generators. Staff also reminded service providers that generator refueling schedules should be designed to meet the 72-hour backup power requirement.

Staff analyzed service providers' Plans submitted in 2023 to determine what improvements had been made to sites visited in 2022. Fourteen (14) of the original forty-four (44) sites that were found to be lacking backup power at the time of 2022 site visits are now equipped with 72 hours of backup power. See the before-and-after depiction of network resiliency improvements after 2022 site visits in Figure 8 below.



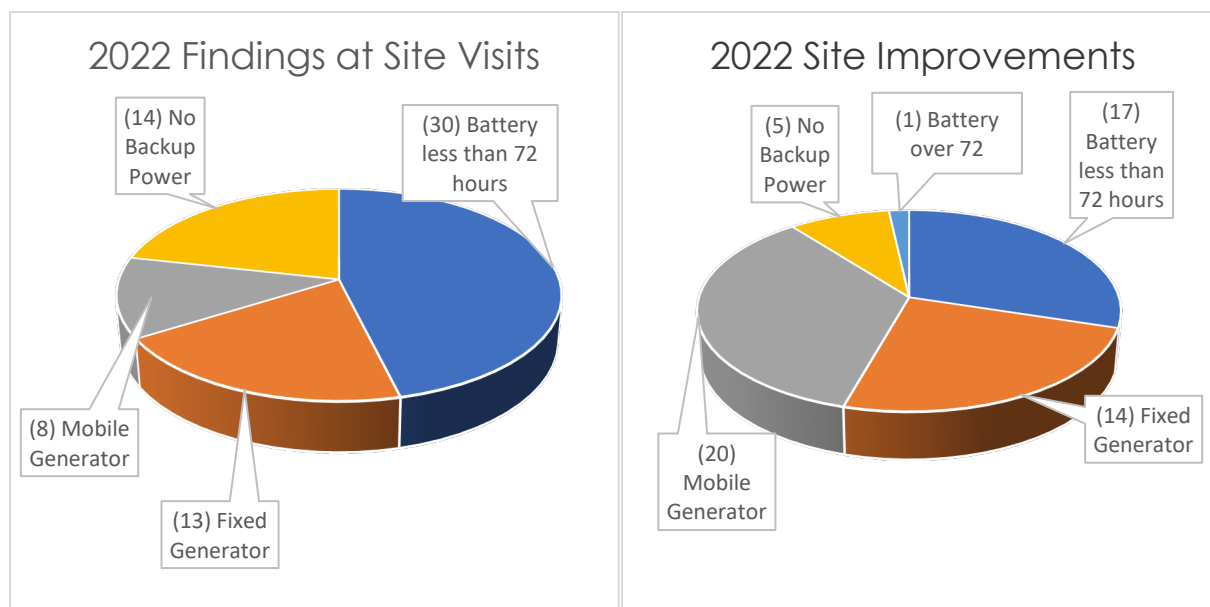
Staff found, however, that twenty-two (22) sites visited in 2022 still do not have 72 hours of backup power.<sup>16</sup> (Also, Staff learned that one (1) site was decommissioned and seven (7) were not reported<sup>17</sup> in the Plans that service providers submitted in 2023.)

See below for a breakdown of the twenty-two (22) sites visited in 2022 that still do not comply with the EDRP Decisions’ backup power rules:

- All twenty-two (22) sites are in the southern area of the state and most of them are coverage sites installed within a right-of-way.<sup>18</sup>
- Ten (10) of these sites are Verizon Wireless, five (5) are AT&T Mobility, one (1) site is AT&T California, five (5) are T-Mobile sites, and one (1) is an MCI Communications<sup>19</sup> site.
  - The five (5) AT&T Mobility sites did have some battery backup, though not enough to be compliant with the EDRP Decisions.

Staff continue to request that service providers explore creative ways to install sufficient backup power, transport diversity, and/or harden these sites.

Figure 8: 2022 Site Visit Findings by Type of Backup Power



<sup>16</sup> This Report does not include data from 2024 annual Plans.

<sup>17</sup> Summary of facilities can be found at [Communications Network Resiliency](#).

<sup>18</sup> The primary use of the poles in the right-of-way may take precedence over the communications facility it is hosting (i.e. power distribution).

<sup>19</sup> MCI Communications, LLC, is a wholly owned subsidiary of Verizon.

## Results Summary of Early Site Visits in 2021 & 2022

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Engineers visited eighty-nine (89) sites in the first two years of the Program and found that only twenty-seven (27) had 72 hours of backup power at the time of the site visits, leaving sixty-two (62) sites without sufficient backup power and their customers vulnerable during an outage.

Site visits helped improve service providers' compliance with Emergency Disaster Relief Program requirements. Since these 2021 and 2022 site visits, the initial sixty-two (62) sites lacking sufficient backup power has reduced by nearly half. In other words, there are now twenty-eight (28) additional facilities equipped with 72 hours of backup power as a direct result of the 2021 and 2022 site visits.

Staff continues to request that service providers explore alternative solutions to comply with resiliency strategies and install sufficient backup power.

# Sites Visited in 2023

## 2023 Site Visits Span the State

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Engineers visited a total of ninety-seven (97) sites in 2023. Engineers conducted site visits from Humboldt County down to the state's most southern border of San Diego County, and from the coastline across the state to the Nevada border.

The California state map below in Figure 9 depicts 2023 site visit locations. The map shows the Tier 2 and 3 HFTD areas and county lines.

The EDRP Decisions' resiliency requirements are currently limited to areas within the state as designated as Tier 2 and 3 HFTD. Thus, Staff limited site visits to those areas. While Tier 2 and 3 HFTD areas are high priority due to their elevated threat of wildfire, Staff notes that communications services in any area of the state are impacted by service disruption regardless of communications facility location. That is because communications infrastructure is a network and is not installed in accordance with HFTD Tiers. Basically, service providers should ensure that their entire networks are resilient, especially those facilities installed in Tier 1 HFTD that are designed to support facilities in Tier 2 and 3 HFTD.

Figure 9: Map of Sites Visited in 2023



## Site Selection Expansion in 2023

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Staff expanded the criteria when selecting sites to visit in 2023. Each technical and operational component of communications networks that Staff has an opportunity to examine during a site visit could help improve compliance with the 72 hours of backup power requirements. Additional considerations in the site selection for the 2023 site visits over previous years were:

1. Staff shifted focus onto wireless sites in 2023 since a large proportion of wireless facilities were reported as not having sufficient backup power.<sup>20</sup>
2. Engineers began visiting sites in 2023 that service providers reported as having sufficient backup power to validate information reported, and to assess whether generator fuel capacities met the requirements of the EDRP Decisions.
3. Service providers reported a heavy reliance on mobile generators for their backup power. Engineers selected mobile generator storage locations (warehouses) to visit in 2023, and:
  - a. Examined the condition of the warehoused generators and whether there were sufficient units in storage to cover the sites assigned to them,
  - b. Evaluated whether the mobile generators are stored within proximity to the sites they are assigned to; and
  - c. Discussed with service providers how they might overcome the challenges in deploying to specific areas when urgent deployment is needed (such as distance, traffic, accessibility of sites, etc.).
4. Sites were selected that had been identified as having longer than average outage durations in actual emergency disaster event(s).
5. Staff added a significant number of virtual site visits in 2023, implementing a safe and effective way to examine sites with difficult access due to challenging terrain or extreme weather. These virtual visits were mostly conducted for sites located atop mountains impacted by winter storms.

## Breakdown of 2023 Sites Visited

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### Number of Sites Visited in 2023 by County

Engineers visited sites located in twenty-seven (27) of the fifty-eight (58) counties in California. See Table 1 below for the number of sites visited in 2023 by county and service provider name.

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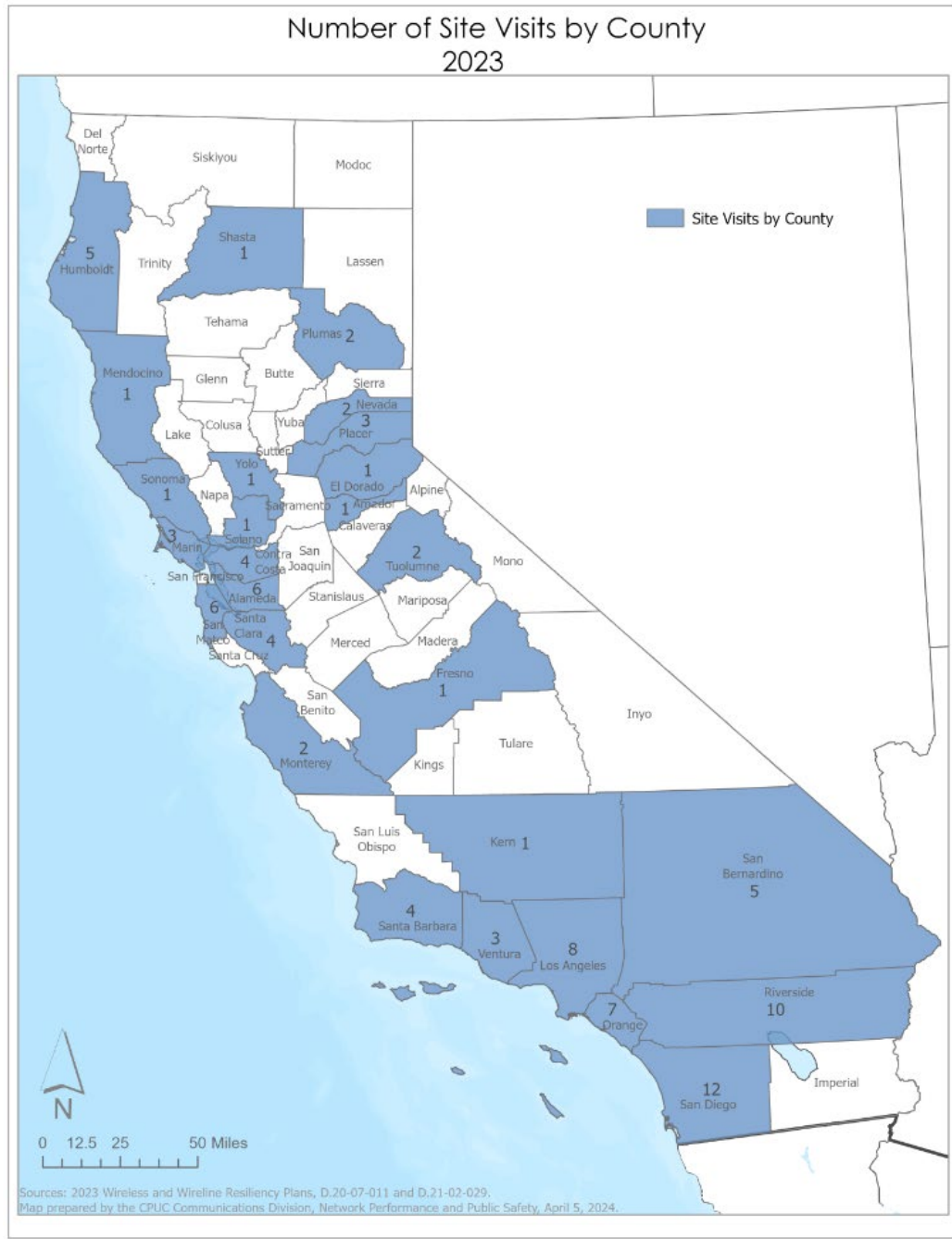
<sup>20</sup> Wireless providers reported in their 2023 Communications Resiliency Plans that 1,509 of their 5,388 facilities lacked 72 hours of backup power. Summary of facilities can be found at [Communications Network Resiliency](#).

Table 1: Number of Sites Visited in Tier 2 and 3 HFTD by County and Service Provider

County	Number of Sites Visited	Service Provider d/b/a or Company Name
San Diego	12	Cox Communications, Mediacom, Verizon Wireless
Riverside	10	AT&T Mobility, Charter Communications, Frontier
Los Angeles	8	AT&T Mobility, AT&T California, Verizon Wireless
Orange	7	AT&T Mobility, Cox Communications, T-Mobile
Alameda	6	AT&T Mobility, T-Mobile
San Mateo	6	T-Mobile, Comcast
Humboldt	5	AT&T Mobility, T-Mobile, Frontier
San Bernardino	5	AT&T Mobility, Verizon
Contra Costa	4	T-Mobile
Santa Barbara	4	AT&T Mobility, Cox Communications, T-Mobile
Santa Clara	4	AT&T Mobility, T-Mobile
Marin	3	Comcast
Placer	3	AT&T Mobility, T-Mobile
Ventura	3	AT&T Mobility, T-Mobile
Monterey	2	AT&T Mobility
Nevada	2	AT&T Mobility, T-Mobile
Plumas	2	AT&T Mobility, T-Mobile
Tuolumne	2	Verizon Wireless
Amador	1	Verizon Wireless
El Dorado	1	Verizon Wireless
Fresno	1	Verizon Wireless
Kern	1	Frontier
Mendocino	1	UScellular
Shasta	1	Frontier
Solano	1	Verizon Wireless
Sonoma	1	T-Mobile
Yolo	1	T-Mobile

See Figure 10 below for a state map depicting the number of sites visited per county in 2023. Many of the sites visited in 2023 are wireless sites situated in the southern part of the state.

Figure 10: Map and Number of Sites Visited in Tier 2 and 3 HFTD by County



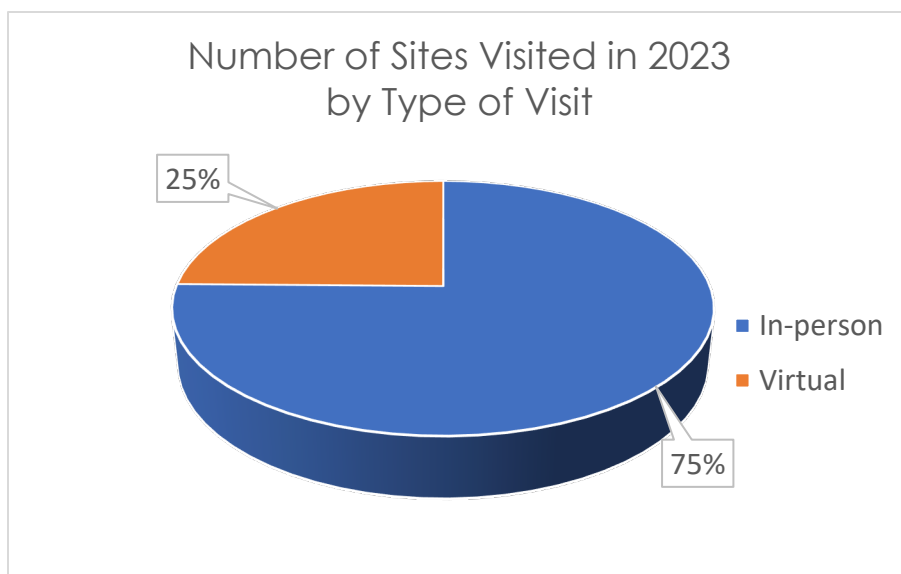
### Number of Sites Visited in 2023 by Type of Visit

A significant number of virtual site visits were added in 2023 over previous years.<sup>21</sup> While physical site visits are generally preferred, some sites would otherwise not be “visited” without a virtual option. Virtual site visits are conducted to examine locations difficult to access due to challenging terrain, extreme weather, lack of wireless communications coverage, or because special equipment or gear is necessary to safely visit.

There were seventy-three (73) physical site visits and twenty-four (24) virtual visits in 2023. See Figure 11 below depicting the breakdown of the ninety-seven (97) total sites visited in 2023 by visit type.

Staff requested video calls to virtually tour the facility with the service providers’ representative at the site. Staff also requested site data such as photographs of the facility along with detailed information about the power system and its backup capacity. A completed Site Assessment Checklist is required for all site visits, whether visits are conducted virtually and physically.<sup>22</sup> The documentation and resolution of problems found at site visits is the same process for both visit types.

Figure 11: Number of Sites Visited in 2023 by Type of Visit



<sup>21</sup> There were no virtual site visits in 2021, one virtual visit in 2022, and twenty-four (24) virtual visits in 2023.

<sup>22</sup> Service providers submitted Site Assessment Checklists as confidential pursuant to G.O 66-D.

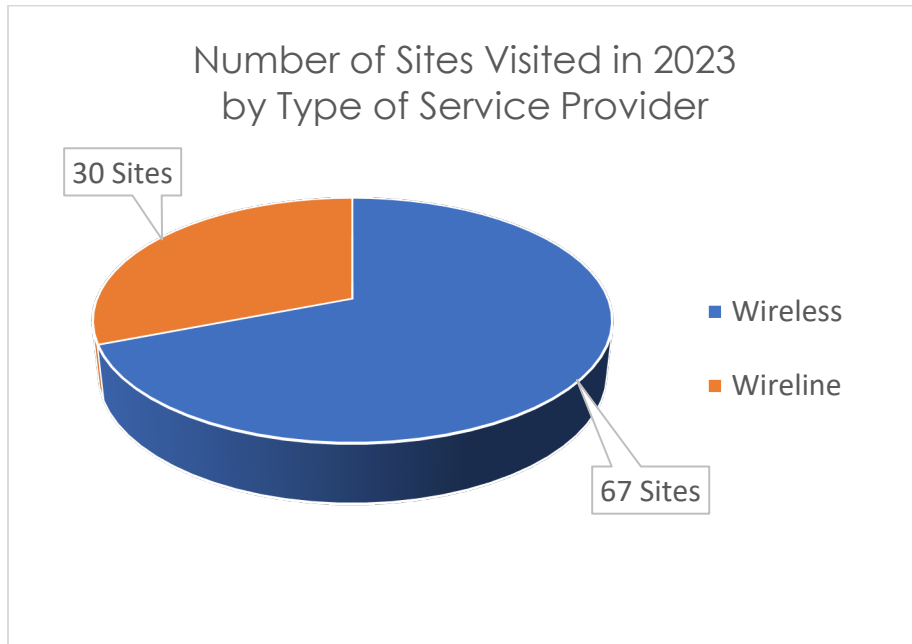


### Number of Sites Visited in 2023 by Type of Service Provider

Staff increased focus on wireless site in 2023 due to wireless service providers submitting Plans indicating that a large proportion of their sites do not have sufficient backup power.<sup>23</sup> See Figure 12 below for breakdown of wireless and wireline site visits in 2023.

Engineers visited a variety of wireless site types including small cells and oDAS systems that are installed in the right-of-way. Engineers also visited tower-mounted radio sites located atop mountains impacted by winter storms that could render the facilities inaccessible to deploy or refuel generators for days, weeks, or months dependent upon the severity of the storm and damage to the area.

Figure 12: Number of Sites Visited in 2023 by Type of Service Provider



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<sup>23</sup> Wireless providers reported in their 2023 Communications Resiliency Plans that 1,509 of their 5,388 facilities lacked 72 hours of backup power. Summary of facilities can be found at [Communications Network Resiliency](#).

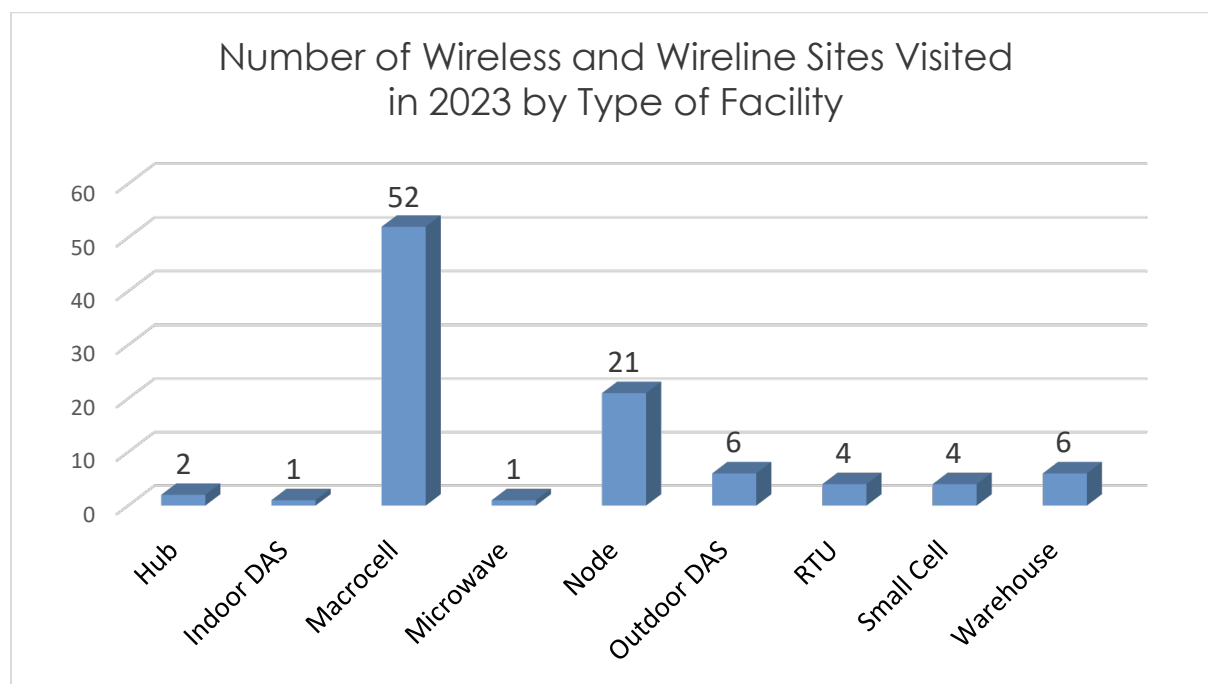
### Number of Sites Visited in 2023 by Type of Facility

Engineers visited a wider variety of facility types<sup>24</sup> in 2023 than in previous years.

A large proportion of the sites Engineers visited in 2023 were wireless macrocell sites. Macrocells may provide service to a wider geographical area and therefore have the potential to impact a larger number of users in an outage. Staff added more visits in 2023 to small cells based on service providers reporting in their Plans<sup>25</sup> that a significant number of them lacked 72 hours of backup power.

Staff added visits to mobile generator storage “warehouse” locations in 2023 due to the high concentration of facilities reported in service providers’ Plans as reliant on mobile generators for backup power. See Figure 13 below for a breakdown of both wireless and wireline sites visited by facility type.

Figure 13: Number of Wireless and Wireline Sites Visited in 2023 by Type of Facility



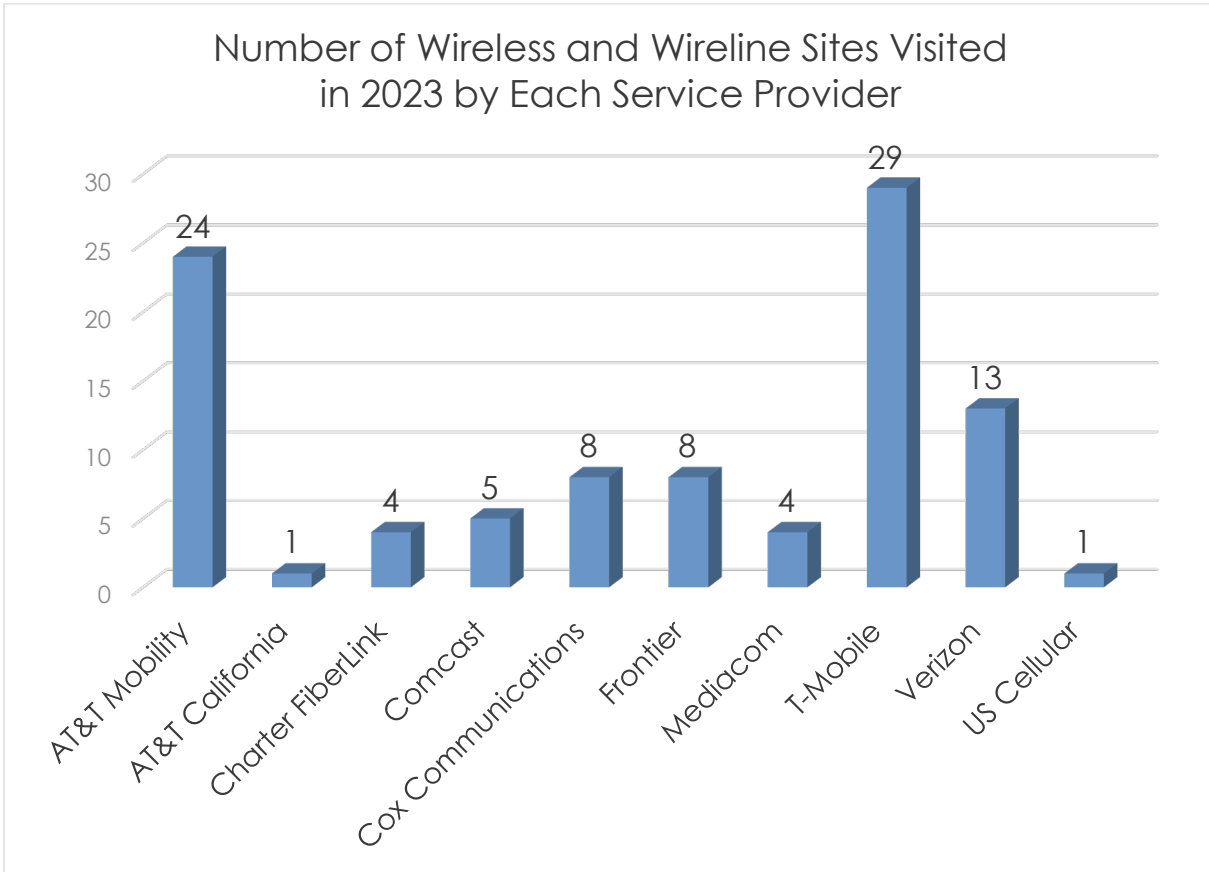
<sup>24</sup> For more information see Figure 3, Appendix B, and the Glossary in this Report.

<sup>25</sup> 2023 Communications Resiliency Plans for wireless service providers reported 1,509 of their 5,388 facilities lacked 72 hours of backup power as compared to 276 of the 12,737 wireline facilities. Summary of facilities can be found at [Communications Network Resiliency](#).

### Number of Sites Visited in 2023 by Each Service Provider

See Figure 14 below for a breakdown of each wireless and wireline service provider’s sites visited in 2023. Engineers visited a significant number of wireless sites due to a large proportion of wireless sites reported as not having sufficient backup power.<sup>26</sup>

Figure 14: Number of Wireless and Wireline Sites Visited in 2023 by Each Service Provider



<sup>26</sup> Wireless providers reported in their 2023 Communications Resiliency Plans that 1,509 of their 5,388 facilities lacked 72 hours of backup power. Summary of facilities can be found at [Communications Network Resiliency](#).

## 2023 Findings at Wireless Sites Visited

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Engineers visited a total of sixty-seven (67) wireless sites in 2023 which included twenty-nine (29) T-Mobile sites, twenty-four (24) AT&T Mobility sites, thirteen (13) Verizon sites, and one (1) US Cellular site.

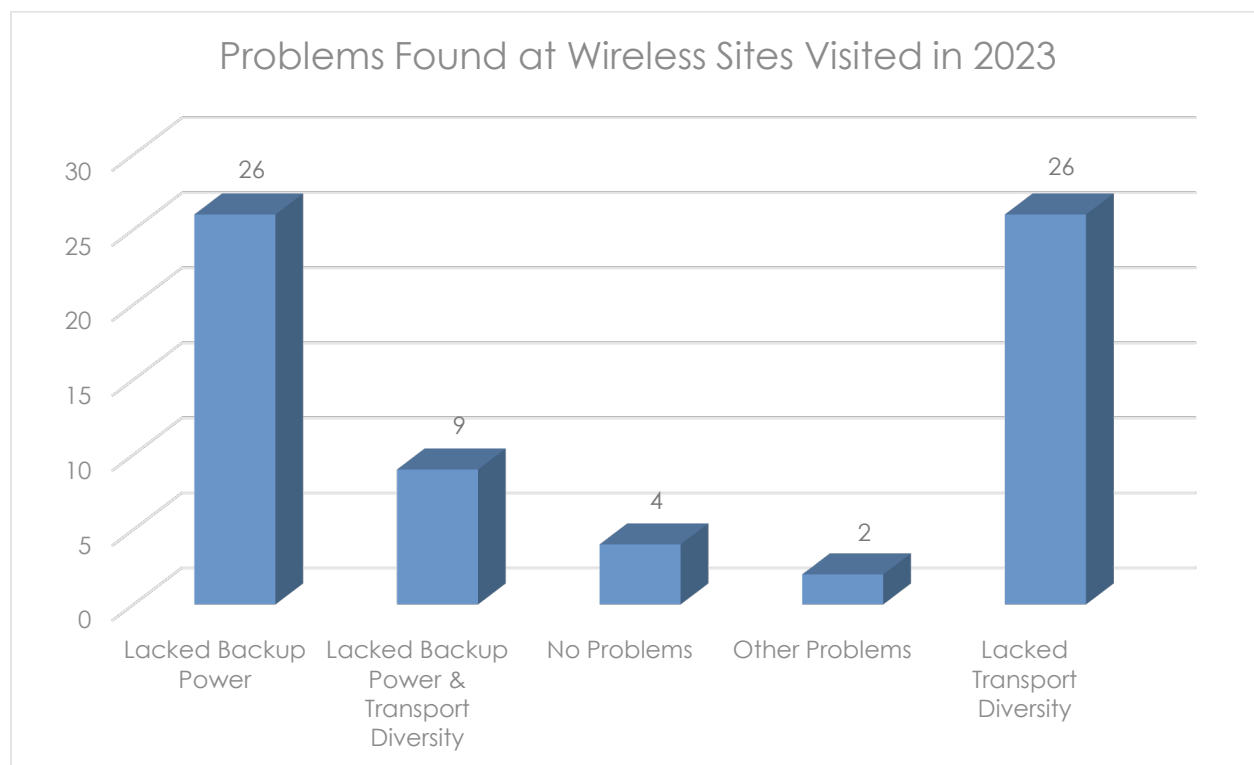
Thirty-five (35) of the sixty-seven (67) total wireless sites visited in 2023 lacked 72 hours of backup power. The wireless sites visited in 2023 that were found to lack 72 hours of backup power are T-Mobile, AT&T Mobility and Verizon. In addition, nine (9) of the (35) thirty-five sites that were found to lack sufficient backup power *also* lacked transport diversity. Also noted, twenty-six (26) sites visited lacked transport diversity.

See Figure 15 below depicting problems found at wireless sites visited in 2023.

Site visits categorized as “No Problems” indicate that Engineers found these four (4) sites to be compliant with the resiliency strategies in the Decision at the time of the site visit, and no further discussion with the service providers was required. Two (2) of the sites visited in “No Problems” category were mobile storage warehouses that Staff examined for readiness to deploy mobile generators.

“Other Problems” were sites that were found to have 72 hours of backup power and transport diversity at the time of the site visit, yet Engineers found other issues to address with service providers. For example, Engineers made recommendations for service providers to take special measures to protect backup power on site from becoming inaccessible due to heavy snowfall, and at another location Engineers recommended the service provider take precautionary measures to protect equipment from flooding.

Figure 15: Problems Found at Wireless Sites Visited in 2023\*



\*Figure 15 depicts a subset of key data points related to the site visited; the (2) warehouses visited are included under “No Problems” sites.

### Breakdown of Problems with AT&T Mobility Sites

Eleven (11) of the thirty-five (35) total wireless sites visited in 2023 that lacked 72 hours of backup power belong to AT&T Mobility. This included six (6) macrocells, four (4) oDAS, and one (1) Indoor Distributed Antenna System (iDAS).

Below are a few key data points regarding these eleven (11) AT&T Mobility sites lacking sufficient backup power at the time of the site visits.

- Nine (9) of the eleven (11) sites had batteries installed, but the batteries lacked sufficient capacity to comply with the Decision.
- AT&T Mobility indicated it would deploy mobile generators for backup power to five (5) of the eleven (11) sites, but Engineers found that four (4) of these five (5) sites lacked the proper “hook-up”<sup>27</sup> for mobile generators.
- Two (2) of the oDAS sites had no backup power *at all*.

<sup>27</sup> Mobile generators require a connection attachment to network facilities, often referred to as an Appleton or Camlock plug, to “hook-up” backup power.

## Breakdown of Problems with T-Mobile Sites

Nineteen (19) of the thirty-five (35) total wireless sites visited in 2023 that lacked 72 hours of backup power belong to T-Mobile. Below are key data points regarding those nineteen (19) T-Mobile sites:

- All nineteen (19) were macrocell sites; fourteen (14) of which are reported by T-Mobile to be coverage sites.<sup>28</sup>
- Nine (9) of these nineteen (19) sites also lacked transport diversity.
- Twelve (12) of these nineteen (19) sites are installed in the right-of-way.

## Breakdown of Problems with Verizon Wireless Sites

Five (5) of the thirty-five (35) total wireless sites visited in 2023 that lacked 72 hours of backup power belong to Verizon Wireless. Below are data points regarding the Verizon Wireless sites at the time of the visit.

- The five (5) sites that were found to be lacking 72 hours of backup power included four (4) small cells and one (1) oDAS.
- All five (5) of these sites are in Los Angeles and San Diego counties.
- Even though these sites are reported by Verizon Wireless as coverage sites, these sites have no backup power *at all*.
- Verizon Wireless reports that these (5) sites are not feasible for 72 hours of backup power due to physical space constraints and right-of-way restrictions.

## 2023 Wireless Site Improvements Summary

Based on follow-up conducted by Staff, wireless service providers have resolved just four (4) of the thirty-five (35) sites visited that were found to be lacking 72 hours of backup power.<sup>29</sup>

A breakdown of Staff recommendations to service providers and improvements made by the service providers thus far, if any, is detailed below:

- **AT&T Mobility:** All eleven (11) sites found to lack 72 hours of backup power at the time of the site visit still do not have sufficient backup power. AT&T Mobility did install two new camlock connections which is an improvement since the 2023 site visits.
  - Staff requested data on two (2) macrocell sites and three (3) oDAS sites that are assigned mobile generators to confirm these facilities are equipped with camlock connections. AT&T Mobility confirmed that the two (2) macrocells are equipped with camlock connections, but the three (3) oDAS are not. Staff continues to follow-up regarding AT&T Mobility's progress installing camlock connections at these three (3) oDAS facilities.

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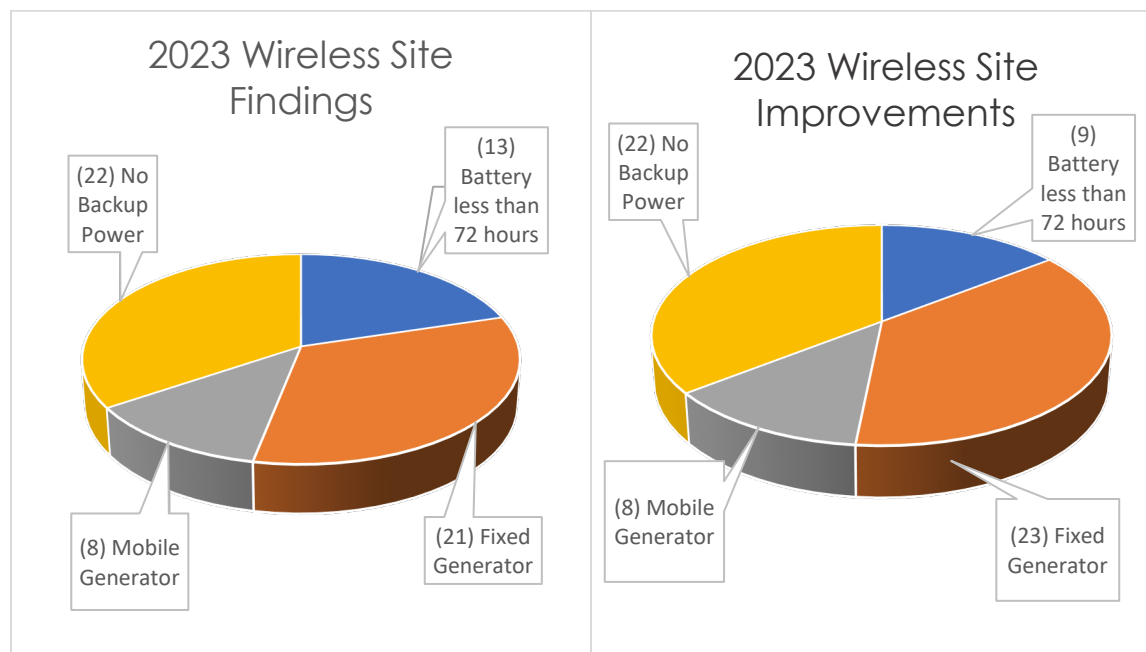
<sup>28</sup> Generally, when a coverage site loses power, then the area it is designed to serve will lose service.

<sup>29</sup> This Report does not include data from 2024 annual Plans.

- Two (2) macrocell sites are assigned mobile generators which are estimated to take approximately 13 hours to deploy. Staff continues to follow-up with AT&T Mobility regarding its progress toward either installing enough batteries to avoid an outage while the mobile generator(s) is being deployed or installing fixed generators. AT&T Mobility has not yet confirmed whether either solution has been implemented.
  - Two (2) macrocell and one (1) oDAS sites found to be lacking backup power are installed in the right-of-way. Staff recommended the service provider install the proper “hook-up” for a mobile generator. AT&T Mobility has confirmed that these sites now have camlock connections for hooking up to mobile generators.
  - The final one (1) iDAS site was deployed primarily for the people working in a specific building. The Engineers recommended that AT&T Mobility examine the building's backup power sources and consider utilizing them. AT&T Mobility has reported it will use the building's power as backup while it prepares to install an uninterrupted power supply system.
- **T-Mobile:** Fifteen (15) of the nineteen (19) sites found to lack 72 hours of backup power at the time of the site visit have not improved.
    - T-Mobile resolved four (4) of its nineteen (19) facilities lacking 72-hours of backup power by assigning mobile generators.
    - The remaining (15) are located within the right-of-way. Staff recommended to T-Mobile that it ensure these sites have the proper “hook-up” for mobile generators. T-Mobile acknowledged Staff's recommendation and agreed to evaluate each site for the installation of a camlock connection. Staff reviewed the most recent Plan T-Mobile submitted, and T-Mobile has not yet implemented a backup power solution for these (15) fifteen sites. Staff is addressing these fifteen (15) sites, among others with T-Mobile, which continue to lack 72 hours of backup power per their most recently submitted Plan.
  - **Verizon Wireless:** All five (5) sites found to lack 72 hours of backup power at the time of the site visit have not improved.
    - The five (5) sites lacking sufficient backup power were not resolved. They are small cells and oDAS facilities installed in the right-of-way. Staff have since learned that radio units are not installed at this oDAS location, and therefore the antennas are considered “passive.”
    - Staff have recommended that Verizon Wireless ensure these five (5) sites have the proper “hook-up” for mobile generators. Verizon Wireless has met with Staff and CD Management regarding its challenges equipping small cells and oDAS with 72 hours of backup power. Verizon Wireless has agreed to refile its Plan with more data regarding each of these sites that continue to lack 72 hours of backup power.

See the ‘before-and-after’ depiction of network resiliency improvements by wireless service providers in Figure 16 below. Although improvements are still needed, there has been a notable increase in fixed generators installed at sites which previously relied solely on batteries (which rarely meet 72 hours of backup power when used alone).<sup>30</sup>

Figure 16: 2023 Wireless Site Visit Findings by Type of Backup Power\*



\*Figure 16 depicts a subset of key data points related to the site visited; for illustrative purposes some data points are omitted (i.e. warehouses were omitted.)

### Wireless Data Collection Improvements

Improvements have also been made to the data collection process resulting from Engineers’ site visits. For example, Staff have revised the Communications Resiliency Plan template to capture more specific data from service providers. The template now requires that data be submitted regarding the hub (“head-end”) locations of small cell systems to examine the backup power capacity at the hub locations. The template also now requires identifying information regarding overlapping coverage sites when this has been reported as the service provider’s backup power solution to its coverage sites.

<sup>30</sup> This Report does not include data from 2024 annual Plans.



## 2023 Findings at Wireline Sites Visited

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Engineers visited a total of thirty (30) wireline sites in 2023 which included one (1) AT&T California site, four (4) Charter Fiberlink sites, (5) Comcast sites, (8) Cox Communications sites, (8) Frontier sites, and (4) Mediacom sites. All wireline site visits in 2023 were physical site visits except for three (3) of the Frontier sites which were visited virtually. These three (3) Frontier site visits were conducted virtually due to extended travel for Staff and because the use of a four-wheel drive vehicle would have been required to access them.

Engineers found that a total of thirteen (13) of the thirty (30) wireline sites visited in 2023 lacked sufficient backup power to comply with the EDRP Decisions, and one (1) of these thirteen (13) sites *also* lacked transport diversity.

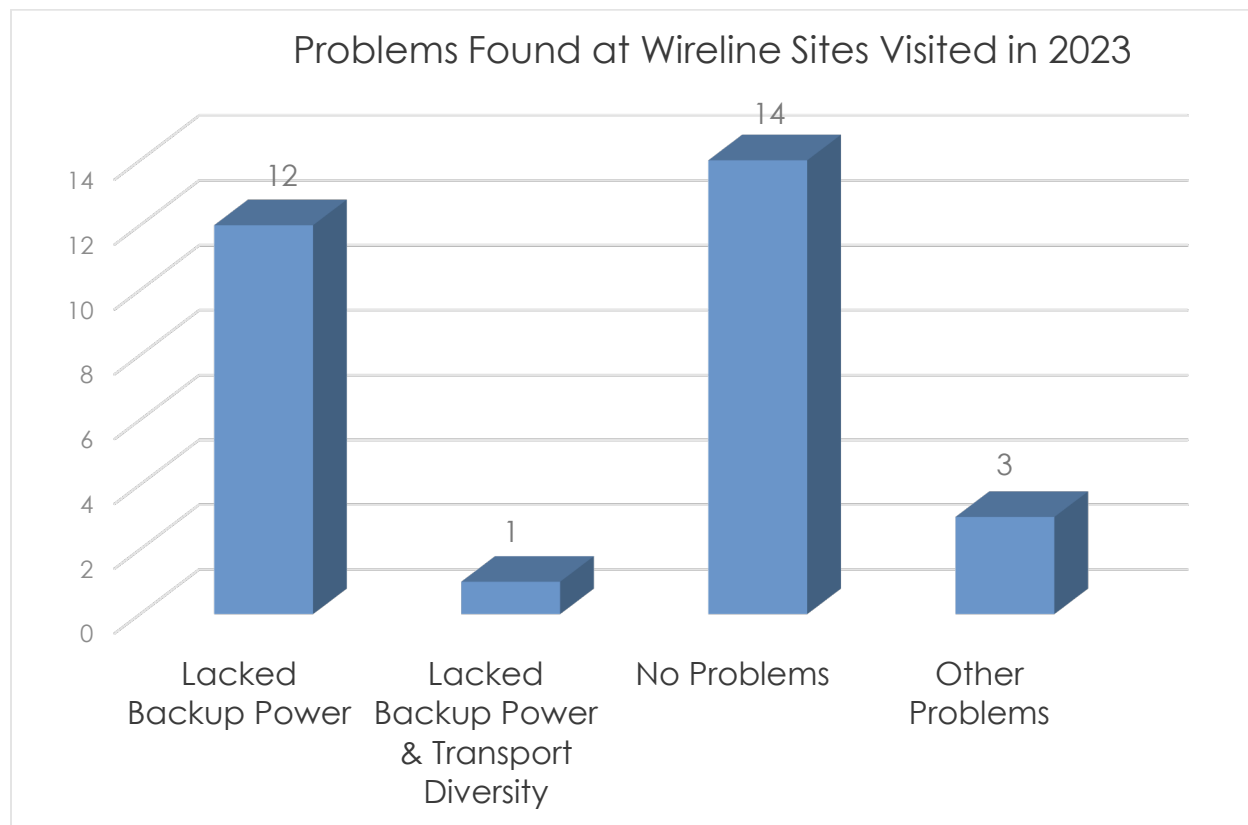
See Figure 17 below for a breakdown of the problems found at wireline sites visited in 2023. “No Problems” are fourteen (14) total sites that Engineers found to be compliant with the resiliency strategies in the EDRP Decisions at the time of visit. Three (3) of the sites in the “No Problems” category were mobile storage warehouses being examined for the readiness to deploy mobile generators.

“Other Problems” sites were found to have 72 hours of backup power and transport diversity at the time of the site visit; however, Engineers found other issues to address with service providers. Specifically, Staff found that the service providers had not reported these three (3) sites in their Plans even though all three (3) had been impacted by actual outages.<sup>31</sup>

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<sup>31</sup> Service providers must submit event-related network outage reports to the CPUC on an ongoing basis for each PSPS or disaster related event. Engineers compare and analyze these outage reports to the annual Plans service providers submit.

Figure 17: Problems Found at Wireline Sites Visited in 2023\*



\*Figure 17 depicts a subset of key data points related to the site visited; the three (3) warehouses visited are included under “No Problems” sites.

### 2023 Wireline Site Improvements Summary

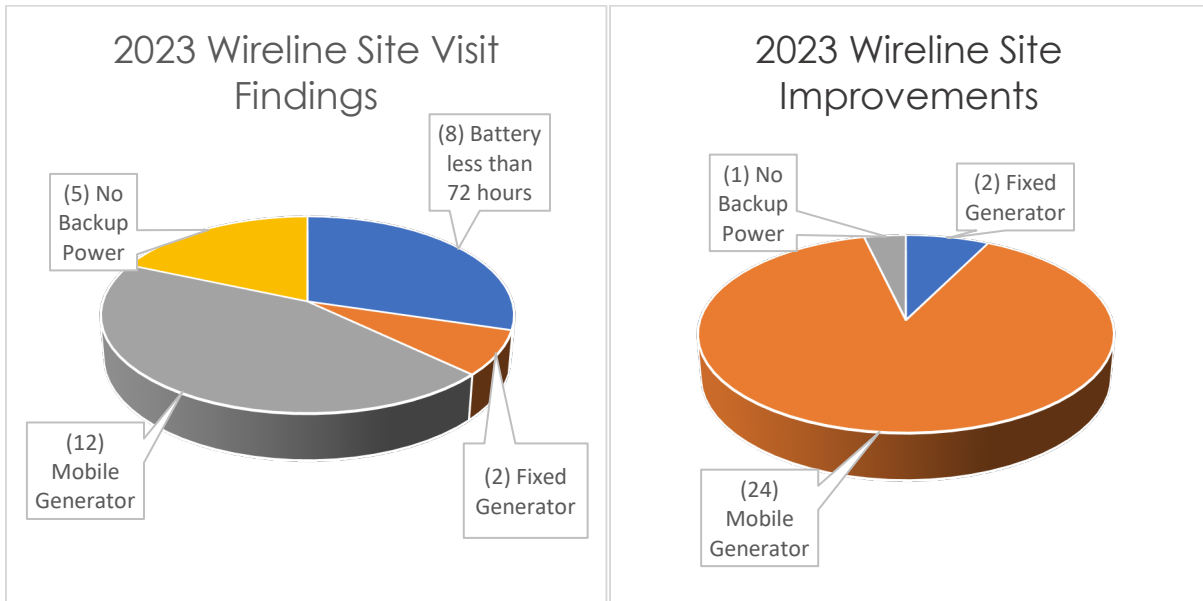
Based on the follow-up from Staff with the wireline service providers, all but one (1) of the thirteen (13) facilities found to be lacking 72 hours of backup power at the time of the visit are now equipped with 72 hours of backup power.<sup>32</sup>

That one (1) site still lacking 72 hours of backup power is an AT&T California site. Engineers noted that AT&T Mobility is collocated at this location and operates a fixed generator. Staff recommended that AT&T California approach AT&T Mobility regarding sharing its fixed generator.

See the ‘before-and-after’ depiction of wireline network resiliency improvements in Figure 18 below. There is a notable increase in mobile generators and decrease in sole reliance on battery backup.

<sup>32</sup> This Report does not include data from 2024 annual Plans.

Figure 18: 2023 Wireline Site Visit Findings by Type of Backup Power



# Conclusion & Recommendations

## Site Visits Improve Network Resiliency

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Site visits improve the resiliency of communications networks as per the Commission's Emergency Disaster Relief Program. The impacts of Staff conducting site visits include an increase in communications facilities complying with the EDRP Decisions, improvements to the data reporting process, and growing engagement by service providers.

### Site Visits Impact Communications Networks

Engineers found nearly 60% of the sites visited between 2021 and 2023 lacked 72 hours of backup power. Service providers responded to these site visit findings by reducing that number down to 31%.

See the 'before-and-after' depiction of network resiliency improvements in Figure 19 below,<sup>33</sup> and a few key data subsets about the improvements on 72 hours of backup power that service providers made after Engineers visited their sites:



**Fifty-two (52) sites visited are now equipped with 72 hours of backup power.** Sites found to be without sufficient backup power at the time of the site visit dropped from one hundred and ten (110) to fifty-eight (58), and sites without *any* backup power at the time of the site visit dropped from forty-two (42) to twenty-nine (29).



**Thirty-nine (39) sites visited now have another source of backup power.** Sites reliant *only* on batteries dropped from sixty-eight (68) to twenty-nine (29).



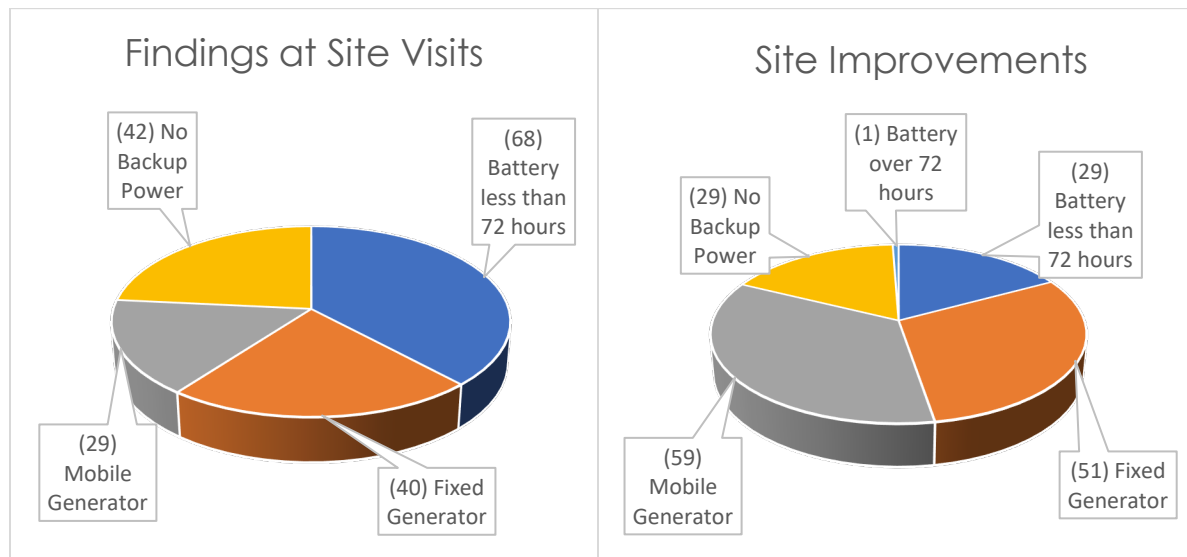
**Service providers added and assigned forty-one (41) generators after site visits.** The number of fixed generators increased from forty (40) to fifty-one (51). The number of sites backed by mobile generators increased from twenty-nine (29) to fifty-nine (59).

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<sup>33</sup> This Report does not include data from 2024 annual Plans.

Engineer field presence and recommendations clearly motivated service providers to improve network resiliency. These swift changes to a small sample of sites indicate to Staff that with focused efforts service providers could comply with the EDRP Decisions.

Figure 19: Overall Site Visit Findings by Type of Backup Power\*



\*Figure 19 depicts a subset of key data points related to the site visited; for illustrative purposes some data points are omitted (i.e. warehouses were omitted.)

### Site Visits Benefit the Emergency Disaster Relief Program

Site visits are an important tool for assessing service providers’ compliance with the EDRP Decisions and contribute to the resiliency of communications networks overall.

- Data submitted to the CPUC is being verified.
- Sites without 72 hours of backup power are examined and recommendations are made.
- Sites reported as having 72 hours of backup power are examined (especially those relying on mobile generators).
- Engineers examined mobile generator storage facilities (warehouses).
- Engineers gain ongoing experience with technological advancements in the field.
- Staff builds rapport with and trains service providers on the Program requirements.
- Site visits lead to process improvements with annual Plans.
- Engineers’ field presence contributes to other site improvements such as maintenance and operational concerns.
- Service providers are aware that Staff may field-verify their facilities.

## Continuous Improvement

Site visits provide Staff opportunities to reinforce the EDRP Decisions which results in better compliance by service providers.

See Figure 20 below illustrating the cyclical reinforcement between site visits and improved network resiliency data.

- Each year service providers' Plans reveal more specific explanations about why their facilities lack 72 hours of backup power.
- More specific explanations from service providers then enable Staff to pose increasingly focused questions,<sup>34</sup> especially about the facilities reported as infeasible.
- Plans contain better data each year which, in turn, Staff use to focus site visit selection criteria.
- Engineers visit more sites to examine, among other criteria, service providers' reasoning for not complying with resiliency strategies.
- Engineers report their site visit findings to service providers and make recommendations on how to overcome infeasibility issues and improve network resiliency.<sup>35</sup>
- Staff and Engineers work with service providers on an ongoing basis to implement the solutions recommended and examine the following year's Plans in search of improvements.

While there is still a significant amount of work to be done to ensure communications networks in California are resilient, service providers are observed increasing their engagement year-over-year in site visits and data reporting. Service providers continue to make improvements each year through repetition and experience, and by responding to Staff's questions and concerns.

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<sup>34</sup> Plans submitted by service providers must now include specific data regarding the type of equipment implemented (i.e. compact and high-capacity batteries), location information for oDAS hubs, comprehensive data regarding mobile generators storage locations or warehouses, and transport resiliency.

<sup>35</sup> See Wireless Resiliency Decision, D.20-07-011, OPs 1 & 3, at pp. 143-146; see also Wireline Resiliency Decision, D.21-02-029, OPs 1 & 5, at pp. 101-103.

Figure 20: Cyclical Reinforcement Between Site Visits and Communications Resiliency Plans



## Key Observations

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### An Overview of Service Providers Response to Site Visits

Service Providers largely accommodated Staff's requests to conduct virtual and physical site visits. Staff acknowledges the service providers' willingness to coordinate site access and meet Engineers at most of the sites the Engineers selected to visit. Most service providers were willing to review and sign Site Assessment Checklists and continued to work through findings and recommendations with Staff after site visits were conducted.

Nearly one-third of the wireless facilities in Tier 2 and 3 HFTD still lack sufficient backup power.<sup>36</sup> Wireless service providers reported in 2023 that 1,509 of their 5,388 facilities lacked 72 hours of backup power as compared to 276 of the 12,737 wireline facilities.<sup>37</sup>

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<sup>36</sup> This Report does not include data from 2024 annual Plans.

<sup>37</sup> Data from Communications Resiliency Plans submitted by service providers requested confidential treatment pursuant to G.O. 66-D. Summary of facilities can be found at [Communications Network Resiliency](#).

Engineers visited wireless sites in 2023 that lacked backup power due to being installed within the right-of-way. Physical space constraints, restrictions in land use provisions and local ordinances, and competing regulations<sup>38</sup> all present challenges to installing backup power in a right-of-way. While installing sufficient backup power requires innovative strategies, Staff contend that overcoming these challenges is not insurmountable when service providers focus on mitigation and innovation.

Wireless service providers made fewer improvements to their network resiliency than wireline service providers after the 2023 site visits. Wireless service providers corrected only four (4) of the original thirty-five (35) sites visited that were found to be lacking 72 hours of backup power, whereas wireline service providers nearly closed their gap.<sup>39</sup>

Visits to wireless sites in 2023 revealed a significant lack of transport diversity. Staff found thirty-five (35) of sixty-seven (67) wireless sites visited in 2023 lacked transport diversity as compared to one (1) wireline site. Based on observations at site visits, wireline networks generally utilized diversified transport (both copper and fiber), thus transport diversity problems did not appear to be as prevalent for wireline facilities as it was for wireless facilities.

### Heavy Reliance on Mobile Generators

Service providers increased the overall count of mobile generators from twenty-nine (29) to fifty-nine (59), assigning thirty (30) additional mobile generators after site visits which highlights the impact of site visits on network resiliency.

The most significant enhancements were made by Frontier who added ten (10) mobile generators after site visits. T-Mobile added nine (9) mobile generators, AT&T Mobility added five (5), Mediacom added four (4), and Comcast and Cox Communications added one each (two more). See Figure 21 below for a depiction of the increase in service providers' Plans to use mobile generators as backup power.

Staff selected four (4) mobile generator storage warehouse locations in 2023 to visit. These warehouses were operated by Comcast, Cox Communications, T-Mobile and Verizon Wireless. Visiting these warehouses provided Engineers the opportunity to examine the count, condition and deployment readiness of the generators and the locations where they are being stored. Engineers found that the estimated number of mobile generators at all four (4) warehouses visited in 2023 was consistent with what service providers had indicated in their Plans. Engineers also found the condition and readiness of the mobile generators to be acceptable.

Although mobile generators may provide 72 hours of backup power once connected to a facility, deploying a mobile generator to its assigned site requires that the site itself be prepared with

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<sup>38</sup> The primary use of the poles in the right-of-way may take precedence over the communications facility it is hosting (i.e. power distribution).

<sup>39</sup> See Figure 19 for Wireline 2023 "before-and-after" site visits depiction.



adequate physical space for the generator and the facility be readily equipped with a connection “plug.” The service provider must also be operationally prepared to deliver the mobile generator to the impacted site in an urgent manner and during an event that often involves several impacted sites at once. Furthermore, if the community is experiencing a commercial power outage during a storm, wildfire, or other disaster event, then mobilizing a generator in heavy traffic or storm situations, for example, may not be possible at the most critical time for the community to access life-saving communications.

The scalability and logistics of deploying mobile generators are serious concerns during an emergency. Generator storage warehouses have varying distances from each of the individual sites they are assigned to support. In many cases, the deployment time of mobile generators to a site exceeds battery backup time on site, which could result in an outage. Staff is concerned that there may be too few generators for the size of the geographical area that a warehouse is slated to serve, and Staff is uncertain of the service provider’s ability to simultaneously deploy many generators at one time should a large-scale disaster event occur.

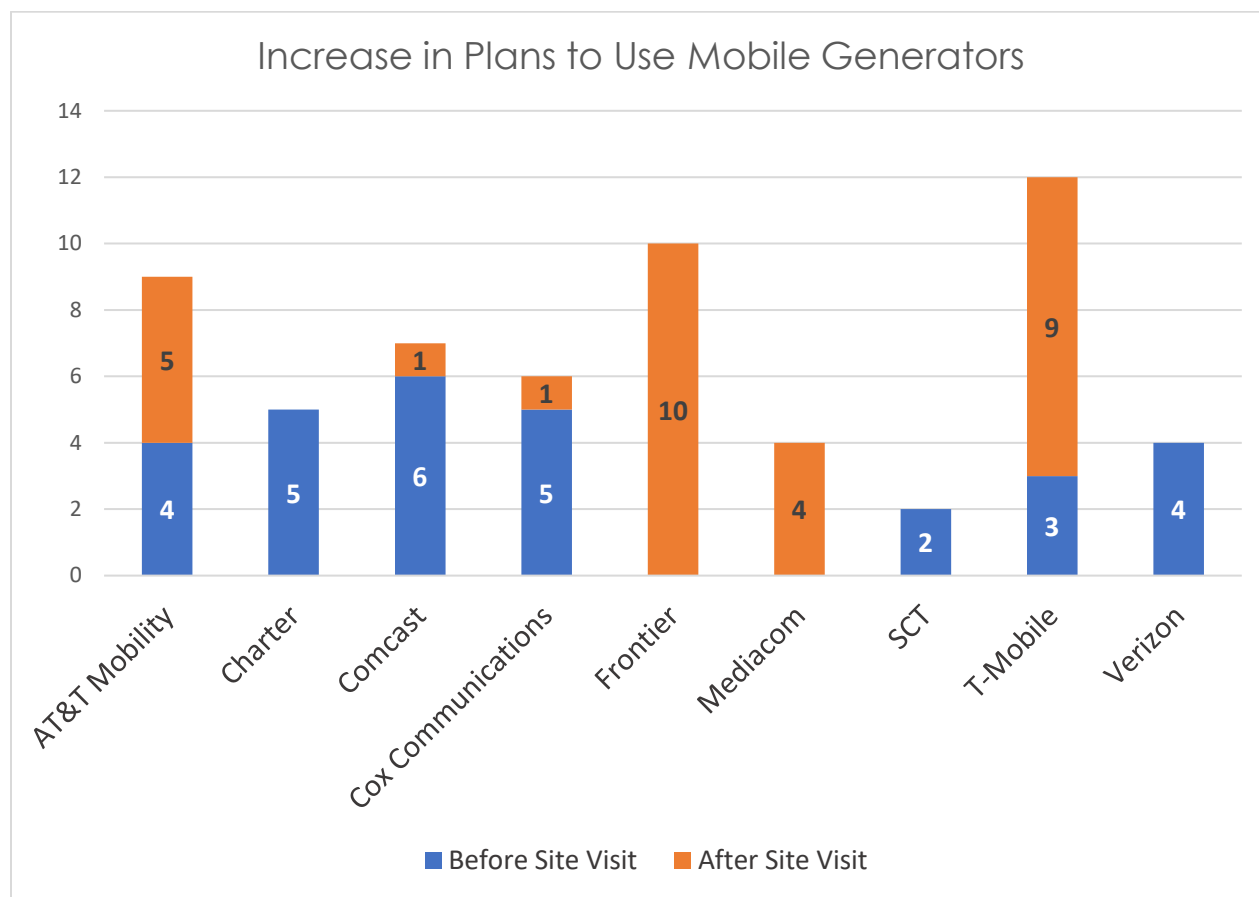
Service providers are responding to the Emergency Disaster Relief Program by assigning mobile generators to sites that lack 72 hours of backup power. Given these scalability and logistical concerns of mobile generators, however, Staff recommended to service providers that they should install fixed generators wherever possible. Additionally, Engineers made specific recommendations to install fixed generators after visiting sites that appeared to have the adequate physical space to accommodate one.

Staff will continue to recommend that service providers implement creative solutions such as compact and long-lasting batteries. Staff will continue to press service providers to explore new designs either from their OEM<sup>40</sup> partners and as part of its innovative network applications and solutions such as renewable power sources, power hubs, and passive antennas.

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<sup>40</sup> Original Equipment Manufacturer (OEM) produces equipment based on its own specifications and designs, generally producing parts that can be marketed by another company.

Figure 21: Overall Mobile Generator Improvements after Site Visits in 2021, 2022 and 2023



### Emerging Technology: Compact, High-Capacity Batteries

Cox Communications, Charter Fiberlink, and Comcast responded to the EDRP Decisions’ requirements by implementing high-capacity batteries that are more compact than traditional batteries.

While batteries may not work for all situations and service providers, implementing compact, high-capacity batteries is evidence that complying with the resiliency strategies and requirements can be successful with innovative backup power solutions.

### Data Submission Processes

Many service providers have been reluctant to report all the required network resiliency information completely and consistently in their annual Plans. Many of the Plans that are submitted are incomplete and must be amended multiple times due to incompleteness and ambiguities in the data submitted. For example, Staff found a discrepancy in AT&T California’s total number of reported

facilities in 2023. AT&T California reported 40% less facilities in 2023 than in 2022.<sup>41</sup> AT&T California's explanation for underreporting its facilities in 2023 is that it is not responsible for backup power at facilities that it classifies as Customer Premises Equipment (CPE). AT&T California purported that its CPE customers, including its wireless affiliate AT&T Mobility, are responsible to supply commercial power to their own fiber distribution terminal per tariff rules.<sup>42</sup>

Staff determined that AT&T California's CPE customers include wireline and wireless communications service providers who are also required to submit their annual Plans demonstrating compliance with the backup power requirements in the EDRP Decisions. Staff contacted these wireless service providers to confirm that their Plans did include their AT&T California CPE facilities for which they are responsible for providing their own power. As an additional effort, Staff strongly encouraged AT&T California to clearly notify its CPE customers in writing of its position that per tariff rules, it is the customer who is responsible for complying with the backup power requirements in the EDRP Decisions.

In conclusion, service providers are actively engaging in the reporting process, but several have found ways to soften accountability as Staff continue to use manual tools. Service Providers submit their Plans using reporting templates which are generally spreadsheets.<sup>43</sup> Some service providers have manipulated the spreadsheet templates, have submitted data on outdated template versions, and changed their year-to-year approach to reporting their data as with the AT&T California CPE example above. Discrepancies between annual data sets for the approximately 21,000<sup>44</sup> facilities located in a Tier 2 and 3 HFTD make it difficult for Staff to control the data submitted. The Rulemaking (R.) 18-03-011<sup>45</sup> associated with this Program remains open which may result in future enhancements to this reporting process.

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<sup>41</sup> AT&T California's data reported in its 2023 Communications Resiliency Plan submitted in 2023 requested confidential treatment pursuant to G.O. 66-D. Summary of facilities can be found at [Communications Network Resiliency](#).

<sup>42</sup> See AT&T California Schedule Cal. P.U.C. No. A2, Rule 2.1.16C.

<sup>43</sup> For [wireless](#) and [wireline](#) Communications Resiliency Plan templates and Emergency Operations Plan (EOP) annual reporting requirements, see CPUC website [Communications Network Resiliency](#).

<sup>44</sup> Pursuant to the EDRP Decisions, wireless and wireline service providers are required to submit Communications Resiliency Plans and Emergency Operations Plans annually to the CPUC. Communications Resiliency Plans contain information about approximately 21,000 facilities in Tier 2 and Tier 3 HFTD. Summary of facilities can be found at [Communications Network Resiliency](#).

<sup>45</sup> See [R.18-03-011](#), and [Communications Network Resiliency](#) webpage.

## Recommendations

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Staff recommends the following:

### Improve Service Provider Reporting Process

Choosing robust samples of sites to visit requires good data. The CPUC should invest in an interactive portal to replace the exchange of spreadsheets with service providers. A systematic way to collect and exchange the most up-to-date data will increase the integrity of all data submitted, help to enforce submittal deadlines, enhance security of the handling of data, and control year-over-year shifts in data sets that service providers routinely apply at will. Additionally, Staff will be able to provide a whole host of analyses that are not currently available.

### Conduct Ongoing Research

Staff are continuing to pursue increasingly focused information regarding the sites that service providers report as infeasible to comply with the EDRP Decisions. Staff will continue to suggest innovative solutions and best practices.

- Staff will pursue technical data to verify wireless service providers' claims of leveraging overlapping wireless coverage sites as their solution for sites lacking sufficient backup power.
- Staff will assess the possibility of wireless service providers implementing new network facilities that could be designed to function as hub-style systems, strategically tied into the network, delivering backup power and transport redundancy when needed.
- Staff will research compliance obstacles impacting wireless service providers' options to install backup power in the right-of-way.
- Staff will continue to require that all service providers explore and implement renewable power resources and clean generation.

### Clean Generation

Clean generation is a goal of the EDRP Decisions.<sup>46</sup> Staff will continue to underscore the importance of implementing clean generation with communications service providers.

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<sup>46</sup> See e.g., Wireless Resiliency Decision, D.20-07-011, OP 1, at pp. 143-146; see also e.g., Wireline Resiliency Decision, D.21-02-029, Section 5.8, at pp. 83-84.

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# Glossary

**AH - Ampere-Hour:** A unit of electric charge representing the amount of electricity delivered in one hour by a current of one ampere.

**Antenna:** A device designed to transmit or receive electromagnetic waves.

**Appleton/Camlock Plug:** A type of electrical plug used for connecting and disconnecting power sources.

**ATS - Automatic Transfer Switch:** A device that automatically switches a power supply between primary and secondary sources to ensure continuous power availability.

**Bollard:** A short, sturdy post used to control or direct traffic.

**Broadband:** A high-capacity transmission technique that carries multiple signals simultaneously.

**Capacity:** A cell site capable of handling a certain volume of mobile traffic, usually measured in terms of the number of simultaneous connections or the amount of data it can handle.

**Cell Sector:** A directional area covered by a cellular base station antenna.

**Central Office:** Main switching facility for a communications service provider.

**Ciena Box:** A device or equipment manufactured by Ciena, a telecommunications networking equipment vendor.

**Coaxial Lines:** Cables used to transmit signals, like TV or internet, with a central wire surrounded by insulation and a metal shield to reduce interference.

**Core Network:** The central part of a telecom network that connects all the smaller networks together and routes the data and call traffic through the network.

**Coverage:** The extent or range of a communication network or service.

**Fiber Optic (“Fiber”):** Optical fibers used in telecommunication for transmitting data as pulses of light.

**Fiber Distribution Terminal:** A box or enclosure where fiber optic cables are connected and split to distribute internet and other services to homes or businesses.

**Fixed Generator:** A stationary power generator designed to provide a reliable source of electrical power.

**Frequency Bands:** Specific ranges of radio frequencies allocated for various communication purposes.

**HFTD - High Fire Threat District:** An area that has an elevated risk of wildfires or is particularly susceptible to the rapid spread of fires.

**Hub Switch:** A network switch serving as a central point for connecting multiple devices.

**Indoor Distributed Antenna System (iDAS):** A network of antennas connected to a common source that provides wireless communication within a building or structure.

**Macrocell:** A large cellular network cell with a broad coverage area.

**Microwave:** A form of electromagnetic radiation used in communication systems, especially for point-to-point communication.

**Microwave Donor Site:** A location that transmits and receives microwave signals to provide communication links, often used in telecommunication networks to connect remote areas.

**Mobile Generator:** A portable power generator that can be moved to different locations as needed.

**Monopole:** A single, tall pole used to support antennas or other communication equipment.

**Natural Gas Power System:** A system that uses natural gas to generate electricity. It is often used for reliable and efficient backup power.

**Node:** A point of connection within a telecommunication network where data is transmitted, received, or processed.

**Outdoor Distributed Antenna System (oDAS):** Similar to Indoor iDAS but designed for outdoor coverage.

**POTS Line - Plain Old Telephone Service Line:** A traditional, analog telephone line.

**PSPS - Public Safety Power Shutoff:** A precautionary measure to shut off power in specific areas to prevent wildfires during extreme weather conditions.

**RTU - Remote Terminal Unit:** A device that interfaces with physical equipment in the field and communicates with a central control system.

**SCE - Southern California Edison:** A utility company providing electric power in Southern California.

**SD&E - San Diego Gas & Electric:** A utility company providing natural gas and electricity in San Diego, California.

**Small Cell:** A compact and low-powered cellular network node designed to enhance wireless coverage and capacity in areas with high user demand or limited coverage.

**Transport Diversity:** The use of diverse and redundant telecommunication paths to enhance network reliability and resilience.

**UPS - Uninterruptible Power Supply:** A device that provides emergency power to a load when the input power source fails.

**Vault Site:** A secure location typically used to house telecommunications or network equipment.

**Vegetation Maintenance:** The practice of controlling and maintaining vegetation to prevent interference with power lines or other infrastructure.



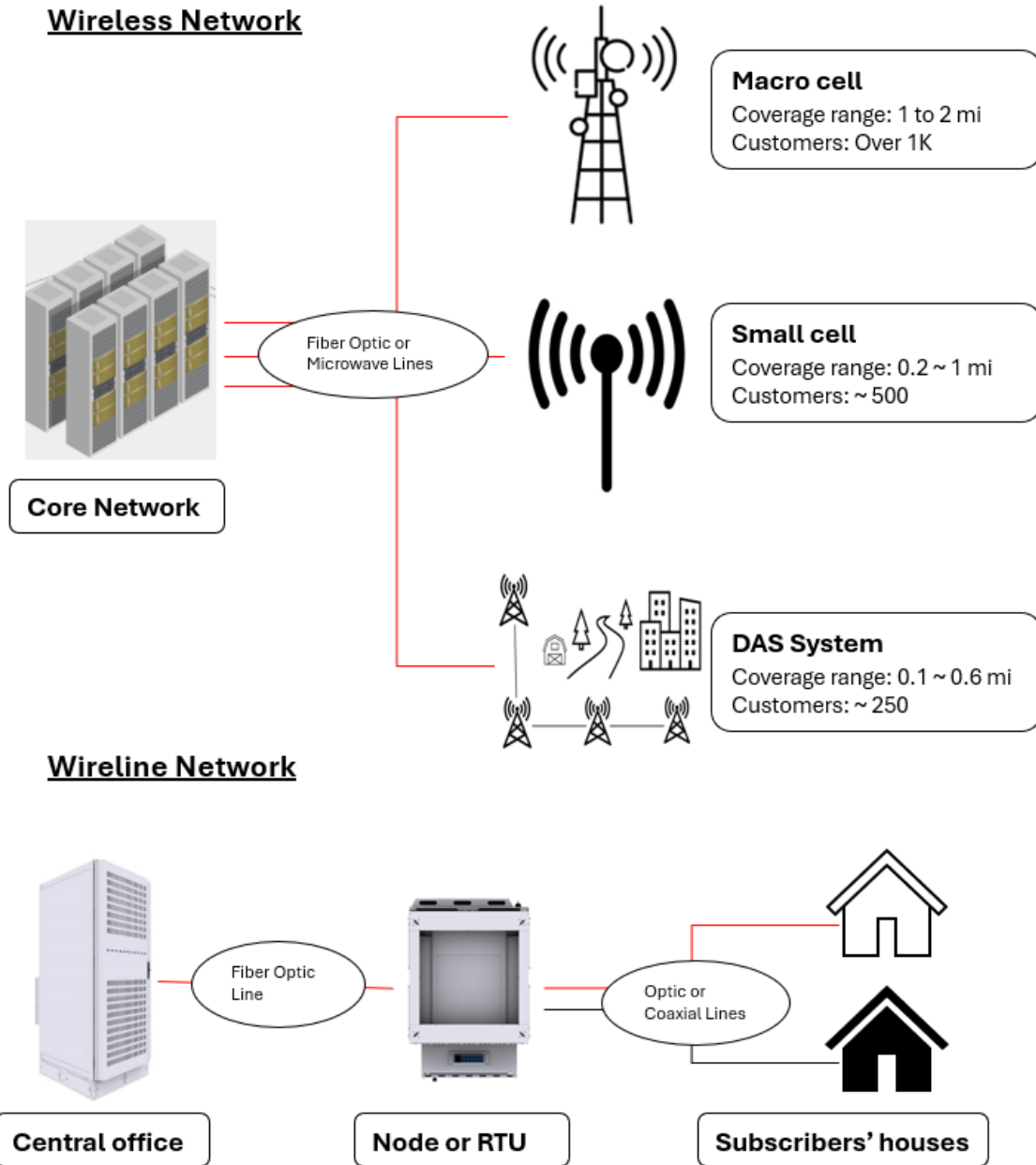
# Appendix A: Site Visit Checklist (2023 Template)

## Site Assessment Checklist

No.	Descriptions	Category	YES/NO	COMMENTS
1	Carrier's representative is available for site walk.	Logistic	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Field representatives are available to answer technical questions during site walk	Technical	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Site Power distribution, Site safety and Security documents must be available.	Safety	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Perform visual check of backup battery, Mobile Generator, Fixed generator, and fuel tanks.	Resiliency	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4(i)	*Specify available Battery backup	Resiliency		(DC Volts, AH)
4(ii)	*Identify location of Portable generator			Address (Lat, long)
5	Check if Coverage Macro Site has fixed generator while visiting small cell	Resiliency [Wireless]		Site Address and Backup power of the Macro site
6	Check Battery pool and portable generator outlets for connecting the portable generators on a shorter notice	Resiliency	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Check if the Site is hardened. If not, determine the reason for infeasibility of 72-hour backup	Resiliency	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Verify the Site has Equipment and Transport redundancy	Redundancy	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Verify all Indoor and outdoor network device cable connections are well insulated to protect from weather and labeled correctly.	Quality	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	Check the cables are run properly on the tray, ladder, conduits, enclosure shelves, and neatly flushed tie wraps.	Quality	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	Miscellaneous [Site observation not covered above]			

Project: <u>Site visit</u> Site Address: _____ CPUC Representative: _____ Signature: ____ Date: _____ Site Engineer: _____ Signature: ____ Date ____
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## Appendix B: Basic Infrastructure Design Illustrations



Appendix B depicts simplified examples of infrastructure designs that service providers might deploy in communications networks. These diagrams are for illustrative purposes only.