Airgain®

Is Your Fleet Connectivity Ready for the Next Storm?

Why Utility Fleets Lose Connectivity When They Need It Most



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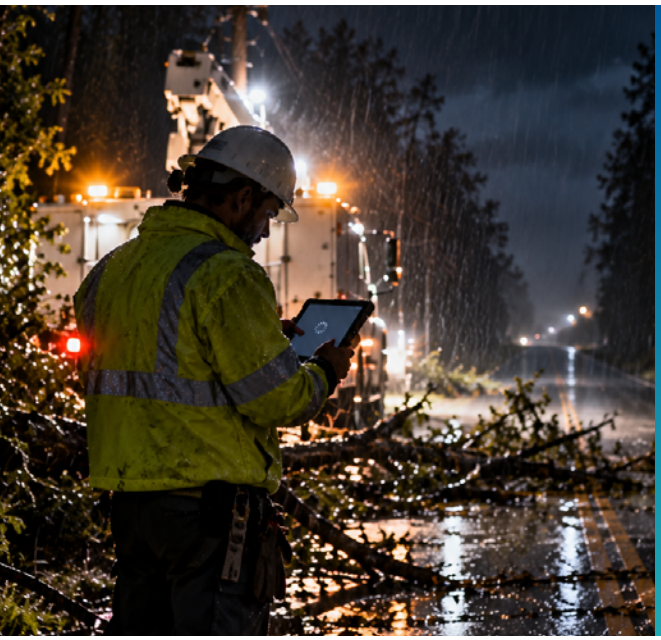
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INTRODUCTION

The storm is when your fleet gets tested



It's 2 a.m. A line crew is at a downed feeder on a county road, 40 minutes from the nearest town. They need the circuit map, the work order, and a damage report sent back to the control center.

The tablet spins. The upload fails. Someone walks up the road holding a phone in the air, looking for one more bar.

This isn't a rare scene. It's what happens when truck connectivity built for normal days meets the conditions utility crews actually work in.

And those conditions are getting harder.

11 hrs

In 2024, U.S. electricity customers averaged about **11 hours without power**, nearly twice the average of the decade before. Major events like Hurricanes Beryl, Helene and Milton caused 80% of those hours.[1]

80%

80% of major U.S. power outages from 2000 to 2023 were caused by weather, and the most recent decade saw about **twice as many** weather-related outages as the first.[2]

Restoration runs on field crews. Field crews now run on data: GIS maps, digital work orders, damage assessments, dispatch updates. When the truck loses its connection, restoration slows down with it.

[1] U.S. EIA | [2] Climate Central, using U.S. DOE outage reports

SECTION 1

It works fine in the yard. That's the problem.

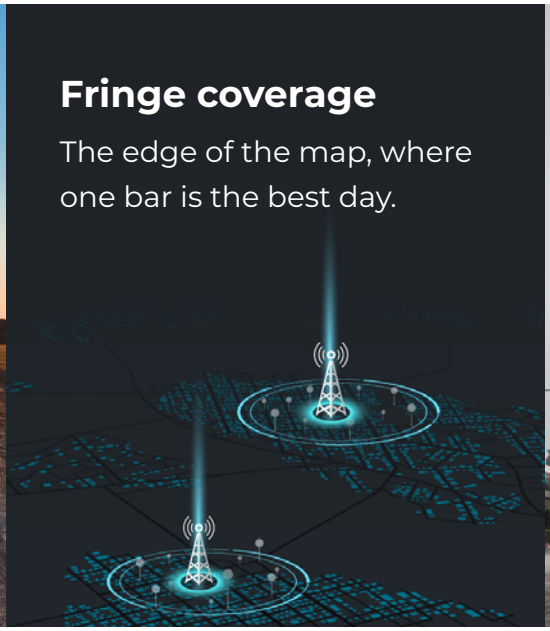
Most fleet connectivity passes every test that happens in town. Strong signal hides weak equipment.

The weaknesses show up where the signal is thin, which is exactly where utility work is hardest:



Rural territory

Long distances between towers, hills and tree cover in the way.



Fringe coverage

The edge of the map, where one bar is the best day.



Storm and fire zones

Where the cell network itself is damaged or running on backup.

That last one matters more than most fleet plans assume. When Hurricane Helene hit in 2024, **more than 14% of cell sites in parts of North Carolina were still offline 11 days after landfall.**[3] Researchers who studied the outage found the towers were mostly still standing. Sites went dark because they lost power or lost the lines connecting them to the wider network.[4]

So during a storm, crews work with less signal, on fewer towers, often on one carrier that's hurting more than the others. When network conditions deteriorate, weaknesses in the vehicle connectivity architecture may decide whether the job gets done.

Connectivity doesn't fail evenly. It fails at the edge, and storms push every crew to the edge.

[3] FCC status report, via Broadband Breakfast

[4] Olukola et al., 2026 preprint

SECTION 2

Nobody designed your truck's connectivity. It piled up.

No utility sat down and designed today's truck setup. It grew one project at a time. Mobile GIS brought a router. Crew Wi-Fi brought a gateway. Vehicle tracking brought a GPS unit. Each came with its own antenna, cable, SIM, power draw and update schedule, often from a different vendor.



The result: a roof full of antennas, cables running through the cab, and a console packed with boxes. Every piece works on its own. Together, they create weak links.

Four areas worth evaluating

1. Long cable runs weaken the signal.

The antenna sits on the roof; the modem sits in the cab. The cable between them loses signal over every metre. A common low-loss cable loses about 0.37 dB per metre at 900 MHz, and more at higher 4G and 5G frequencies.[5] A typical 4–6 metre run can cost around 2 dB. In plain terms: **roughly a third of the signal is gone before it leaves the truck**. In town, nobody notices. On one bar, that's the upload that fails.

[5] Times Microwave LMR-195 datasheet

2. Every connection adds another installation and service point.

Every cable end, splitter and connector is a spot where vibration, rough roads and weather can cause an on-and-off fault that's hard to find.

3. A single-network architecture limits options when coverage conditions change.

A physical SIM ties the truck to one network. If that network goes down in a storm, the truck goes down with it. Switching carriers means a technician touching every vehicle.

4. Multiple platforms can increase management overhead.

Routers, laptops with modems, Wi-Fi hotspots, and GPS tracking solutions from different vendors each need their own updates and settings. Things drift out of step, and every box is one more door for a security problem.

Key point:

The issue isn't how old your equipment is or which vendor you chose. It's how many separate pieces it takes to keep one truck connected. Every box you add to fix a gap is one more thing that can fail.

Fix the weak points as a whole, not one at a time.

SECTION 3

What the weak links cost you

The cost shows up in two places: on storm day, when it hurts most, and on every normal day, when it quietly adds up.





On storm day	On every other day
Damage reports that won't upload	Longer installs for every new or upgraded truck
Dropped GIS maps and VPN sessions mid-job	Service calls to chase cable, connector and SIM faults
Crews driving around to find a signal	Trucks sitting in the shop instead of in the field
Repeat truck rolls because field data came back incomplete	Separate vendors, parts, logins and training for each box
Slower restoration and longer customer outages	Security updates spread across several systems



The costs usually extend beyond hardware

A fleet connectivity architecture can affect:

Installation Labor	Vehicle Downtime	Troubleshooting
Service Visits	Replacement Parts	Cellular/data Services
IT Administration	Software/ Platform Costs	Technology Refreshes

The purchase price is only one part of the equation. The better question is what the architecture costs to deploy, support and change over the life of the vehicle.

SECTION 4

Four principles for a storm-ready fleet

No single setup is right for every fleet. A crew working dense suburbs needs something different from one covering hundreds of miles of rural line. But fleets that hold up in storms tend to follow the same four principles. Each one answers one of the four areas in Section 2.

1. Protect the signal path

What it means	Why it matters on storm day	Question to ask your team
Keep antennas close to the modem, and mount them with a clear view of the sky.	On one bar, the signal lost in a long cable is the difference between an upload that goes through and one that fails.	? How long are the cable runs on our trucks, and what are they costing us in our weakest areas?

2. Build in a backup network where it counts

What it means	Why it matters on storm day	Question to ask your team
Keep your main carrier, but give trucks on critical routes or storm duty a way to switch to a second network.	Storms don't knock out every network equally. When one carrier goes dark, crews with a backup keep working.	? If our main carrier goes down in our territory, which crews lose their connection?

3. Cut parts you don't need

What it means	Why it matters on storm day	Question to ask your team
Use the same parts, install method and setup across the fleet wherever you can.	Fewer parts means fewer faults to track down, and trucks get back in the field sooner.	? How many different truck setups are we running today?

4. Manage it remotely

What it means	Why it matters on storm day	Question to ask your team
Fleet and IT teams can see, fix and update truck connectivity without touching the truck.	During a storm, nobody has time to bring a truck in to swap a SIM or push a fix.	? How many connectivity problems last year needed someone at the truck?

There's more than one way to put these principles into practice. Traditional router-and-antenna setups, all-in-one rooftop units and add-ons for hard-to-reach areas each have a place. The right mix depends on your territory, your applications and how your fleet runs.

Principles in practice: A large Midwestern electric utility



This utility serves rural and low-coverage areas. Its crews were dropping GIS, VPN and telemetry connections, losing damage-assessment uploads, and making repeat truck rolls because field data came back incomplete. The problems were worst during outages.

It replaced separate router-and-antenna setups with an all-in-one rooftop 5G unit that has built-in antennas (principle 1) and switches automatically across FirstNet, Verizon and T-Mobile (principle 2).

The results:

-))) More stable connections in rural and outage zones
-))) Reliable GIS and VPN for field work
-))) Fewer connection drops
-))) Faster restoration and fewer repeat truck rolls
-))) Trucks now act as secure Wi-Fi hotspots for nearby crews

Is your fleet storm-ready? A 5-minute self-check

Tick each one that applies. Be honest; nobody's grading this but the next storm.

	Assessment question	Yes/No
Coverage	Do crews regularly report connectivity problems in known parts of the service territory?	☐
	Have uploads, GIS, VPN or other field applications failed when coverage becomes weak?	☐
Resilience	Does the vehicle have no alternative if the primary cellular network is unavailable?	☐
	Are you unsure which applications need the highest level of connectivity resilience?	☐
Architecture	Has vehicle connectivity grown through multiple projects without a recent architecture review?	☐
	Are long antenna cable runs or multiple separate connectivity components common?	☐
Deployment	Does installation time or configuration vary significantly by vehicle or installer?	☐
Management	Does troubleshooting often require physically accessing the vehicle?	☐
	Are connectivity devices managed through multiple independent platforms?	☐
Lifecycle	Do you lack a clear view of what vehicle connectivity costs to install, operate and maintain over its useful life?	☐

How many did you tick?

- **0–2:** Your setup looks fairly solid. A few targeted fixes may still be worth reviewing.
- **3–5:** Several areas deserve a closer look at how your truck connectivity is set up.
- **6–10:** Your fleet would likely benefit from looking at connectivity as a whole system, rather than fixing issues one at a time.

If you checked off THREE or more, we can help. Contact Us Today

Sources

[1] U.S. EIA — Hurricanes in 2024 led to the most hours without power in 10 years (Dec 1, 2025)

[2] Climate Central — Weather-related Power Outages Rising (Apr 24, 2024; based on DOE Form OE-417)

[3] Broadband Breakfast — Still Monitoring Helene Recovery, FCC Readies for Milton (FCC status as of Oct 7, 2024)

[4] Olukola et al. — The Towers Were Standing: A Cause Decomposition of Cellular Outages During Hurricane Helene (arXiv preprint, Sep 10, 2026)

[5] Times Microwave — LMR-195 datasheet

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