



HOW FREIGHT RAILROADS USE DRONES

Key Takeaways

- Drones help keep workers out of dangerous spots.
- Railroads get a quick look at damage after storms or emergencies.
- AI helps spot problems early and makes maintenance easier.

Freight railroads across North America use drones—sometimes called unmanned aerial systems (UAS)—to make inspecting tracks and other infrastructure easier and more efficient. Skilled and highly-trained railroad workers fly these drones to quickly and safely gather visual and sensor data, saving time while helping safeguard employees. These drones don't work alone, though; they're part of a larger tech toolkit that support freight rail employees, including [AI-powered](#) analytics, LiDAR, automated inspection systems, and connected sensors, all teaming up to boost safety and keep trains running smoothly.

ENHANCING INFRASTRUCTURE INSPECTIONS

Railroads use drones to inspect mainline, tracks, bridges, tunnels, and other critical infrastructure from above, covering long distances far more quickly than traditional ground inspections. They are especially valuable in remote or difficult-to-access areas. Equipped with high-resolution cameras, LiDAR, and thermal sensors, drones can detect obstructions and debris, vegetation growth, structural degradation, drainage issues and erosion, and thermal anomalies indicating potential defects in tracks.

This aerial perspective complements existing inspection systems and helps create a more comprehensive, system-wide view of infrastructure conditions.

IMPROVING SAFETY FOR WORKERS AND OPERATIONS

Drones make it easier for railroads to inspect tough spots—like steep slopes, bridges, and busy tracks—without putting workers in harm's way. This means employees stay safer and there's less need to shut down tracks or bring in heavy machines. By flying regular inspections, drones don't just protect individual workers—they help keep the whole rail system safer by catching problems early.

SUPPORTING RAPID RESPONSE AND RECOVERY

When floods, hurricanes, or wildfires strike, drones are often the first to fly out and check the scene. Thanks to their live aerial views, railroads can quickly spot problems like washed-out tracks, downed trees, or damaged bridges. This quick look helps railroads

figure out what needs urgent attention, helping them prioritize additional inspections and repairs.

DATA-DRIVEN DECISION MAKING AND PREDICTIVE MAINTENANCE

Railroads bring together drone data with AI and analytics to spot patterns, catch unusual changes, and keep an eye on things over time. By comparing aerial scans on a regular schedule, they can stay on top of issues like erosion, growing vegetation, or signs of wear and tear on their infrastructure. With this steady stream of information, railroads can predict maintenance needs and fix problems before they get bigger—making rail operations more reliable, efficient, and easier to manage.

SCALING DRONE PROGRAMS AND SUPPORTING POLICY

Freight railroads are ramping up their drone programs, with some now running big fleets and training hundreds of pilots. To make the most of these new tools, railroads are pushing for policies that let drones do more—especially allowing them to fly farther than the pilot can see (BVLOS). If regulations catch up, drones could check more tracks, work more efficiently, and help in emergencies faster. Additionally, railroads are also protecting their important infrastructure from unauthorized drones.

THE BOTTOM LINE

Drones—combined with AI, sensors, and automated inspection systems—give railroads a faster, safer, and more comprehensive understanding of their infrastructure. By enabling real-time insights, predictive maintenance, and system-wide safety improvements, these technologies help keep the freight rail network resilient, efficient, and secure.