



## The Problem:

The United States Railroad system is often overlooked as a critical infrastructure system, but it plays a vital role in the transportation of goods, passengers, and essential services across the country. Disruption or damage to the rail system could have far-reaching impacts on the economy, public safety, and national security. As a result, protecting and securing the rail infrastructure is a top priority for government agencies, industry stakeholders, and security professionals to ensure its continued operation and resilience.

The open nature of the railway system brings unique challenges related to security and safety:

**Physical security vulnerabilities:** Rail systems can be susceptible to sabotage, vandalism, or theft, which can disrupt operations and pose safety risks.

**Cybersecurity threats:** With the increasing use of digital technologies in rail systems, there is a risk of cyberattacks targeting critical infrastructure and systems.

**Terrorism concerns:** Rail networks are potential targets for terrorist attacks, which can result in significant damage and loss of life.

**Safety regulations compliance:** Ensuring compliance with safety regulations and protocols is crucial to prevent accidents and incidents.

**Insider threats:** Unauthorized access by employees or contractors can compromise sensitive information or tamper with rail systems.

**Network Integrity Systems** has a suite of solutions that meet the challenges faced by the industry, with optical sensing solutions for both Physical and Cyber Security in a single pane of glass. Scan this code to get connected with one of our Sensing Experts.



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## The Solution:

**Distributed Acoustic Sensing (DAS)** is a technology that uses fiber optic cables installed alongside railroad tracks to monitor various characteristics of the tracks. With DAS, the fiber optic cable acts as a long sensor that can detect vibrations and disturbances along the tracks.

DAS allows for continuous monitoring of the entire length of the rail line in real-time, providing a more comprehensive view of the conditions and potential issues. Various parameters such as train speed, track condition, unauthorized access, and potential issues such as track irregularities or obstructions can be detected, located, and remedied before operations are impacted. DAS systems offer high-resolution data and precise measurements, allowing for early detection of abnormalities, defects, or intrusions along the rail line.

DAS secures the optical cables themselves to prevent tampering or damage from inadvertent or malicious attacks.

DAS systems can utilize existing fiber-optic cables along the rail line for sensing, making it a cost-effective solution compared to installing and maintaining multiple hot boxes.

DAS systems may also be monitored remotely from a centralized location, providing easier access to real-time data and alerts for efficient decision-making.

