

The logo for AHEAD, with the word in white capital letters and a blue horizontal bar between the 'E' and 'A'.

AHEAD

Industrial Edge for Rail:

Investing in Next Generation Safety Technologies

Leverage AHEAD's end-to-end solutions for industrial edge deployment, orchestration, and management at scale

Introduction

The rail industry is under new pressure to improve the safety and security of their rail networks after derailments and other accidents have captured public attention. In fact, the latest Railway Safety Act mandates wayside defect detectors, new safety procedures, and increased fines for rail companies that fail to comply.

Investing in next-generation AI technologies like computer vision is a great way for rail companies to implement industrial edge systems to meet the safety standards of upcoming regulations and futureproof their operations.

Learn how industrial edge technologies can improve safety in the rail industry, and how AHEAD provides a complete solution for industrial edge deployment, orchestration, and management.



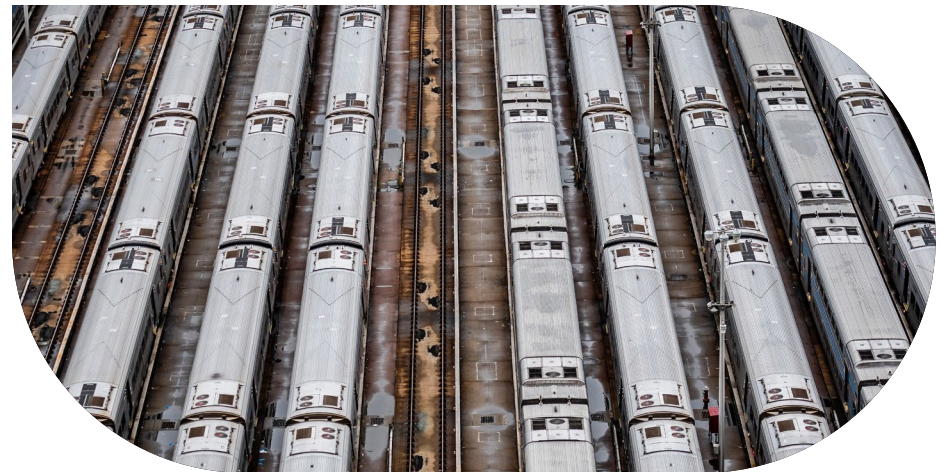
Industrial Edge for Safety in the Rail Industry

As part of a new government mandate, rail companies will be required to install safety and security solutions at rail crossings and rail yards to prevent future accidents. Fleets of industrial edge devices combined with computer vision applications can help rail companies meet these new requirements.

Using data from cameras and other edge sensors, rail companies can leverage AI and computer vision to monitor for incidents at scale. For example, a computer vision application can detect a person who is too close to the tracks or has fallen on the tracks.

It's also possible to identify people or vehicles that are in the middle of the tracks when there is an oncoming train.

Besides personal safety, computer vision could also help identify fallen trees or other obstructions on the tracks which could potentially cause derailments. Identifying these potential safety issues in real time can help rail companies prevent accidents across a large network of rail lines.



Hardware & Software Considerations for Industrial Edge Deployments

When implementing an industrial edge solution for the rail industry it's difficult to design rugged hardware for raiiside deployment environments. There are extended temperature requirements for outdoor deployments and different weather conditions to consider. Installing edge devices close to railroad tracks also introduces additional environmental challenges like vibrations.

Besides withstanding environmental conditions with rugged hardware and enclosures, the edge devices likely need to be mounted differently than a typical rack mount in a data center. These edge devices will also have different connectivity requirements depending on the deployment location. Some areas along a railway track can be in remote locations without wired or cellular options which may require using other wireless connectivity methods.

An effective industrial edge solution also requires software to orchestrate and manage a large fleet of edge devices:

EDGE ORCHESTRATION:

A solution to manage the software of fleets with hundreds to thousands of edge devices. This includes monitoring the health of these systems and managing updates to their firmware, BIOS, and applications at scale. A modern edge orchestration solution should be able to securely push updates across the entire fleet using zero-touch remote provisioning.

EDGE MANAGEMENT:

A solution to track thousands of hardware assets with visibility into where and how they're deployed. This includes managing the lifecycle of these devices and their components across thousands of deployment sites. An edge management solution should also help ensure a consistent bill of materials for at least 3-5 years before needing to refresh the hardware.

How AHEAD Productizes Its Industrial Edge Solutions Engineering

When designing and deploying complex edge devices, consistency becomes crucial for scaling the solution. That's why AHEAD focuses on "producticizing" its custom hardware solutions to streamline the manufacturing and management of large industrial edge fleets.

As part of this productization process, AHEAD associates a complete bill of materials (BOM) and build instructions so that the custom hardware device can be manufactured consistently. Products can also be set up as variable solution sets with applicable customizations for items like memory and storage nestled within a single BOM. Strict revision control processes also helps drive consistency while meeting regulatory requirements.

Finally, lifecycle management of the system itself and warranty support provides a product-like experience when deploying a custom industrial hardware solution from AHEAD.

Industrial Edge for Rail with AHEAD

AHEAD is a leading provider of enterprise technology solutions that can help you deploy, orchestrate, and manage an industrial edge fleet for rail safety. Our industrial edge solutions are customized to meet the needs of your specific rail security and safety use cases while also adhering to regulatory requirements.

Customized Hardware Design

AHEAD designs hardware solutions that are ruggedized for industrial edge deployments. We have a portfolio of customizable building blocks to quickly deliver an edge solution that meets the requirements of rail deployments. These proven reference architectures have been tested and meet basic certifications, reducing the time to deployment and lowering the cost for large-scale edge systems.

Integration Services

AHEAD offers integration services for industrial edge hardware including imaging, configuration, and testing. We can also integrate and install the hardware in weatherproof enclosures and kit components like cables and cameras to enable you to deploy a turnkey solution.

Certification Services

For rail services that operate beyond your country's borders, for example, U.S. companies with tracks that span into Canada and Mexico, AHEAD has in-house certification services to handle regulatory and country-specific certifications. Our specialists are dedicated to ensuring your integrated edge devices are compliant in any country they may be installed.

Global Logistics

AHEAD has decades of global logistics and supply chain expertise, allowing us to streamline the distribution of complex edge hardware to railway crossing and other sites. Kitting services in our warehouses include any additional materials for installation at the deployment sites. We can also assist with creating quick start guides to make field installation as seamless as possible.

Edge Orchestration

AHEAD offers a comprehensive software solution to enable the implementation of industrial edge orchestration. These solutions support VMs and container deployments, so you can quickly and securely push application updates across your entire edge fleet using zero-touch remote provisioning throughout the product lifecycle.

Edge Asset Management

[AHEAD Hatch](#) IT lifecycle management platform can help you track your hardware assets from procurement and manufacturing through deployment and support. Hatch project management features streamline comprehensive or phased rollouts for consistency across sites. Asset management is visible at the site-level giving you the ability trace any asset to its exact location.

Hatch can manage thousands of devices and components, including firmware levels, BIOS, software image revisions, harvested hardware data, warranties and service contracts, and more. Hatch can also integrate with ServiceNow and other leading enterprise platforms to share relevant asset data in real-time. And with Hatch's open API, doing custom integrations with edge orchestration solutions is straightforward and easy to execute.

Security

Finally, AHEAD ensures a full chain of custody for industrial edge solutions. Our custom hardware is designed with a foundational level of security, which includes implementing the trusted platform module (TPM) and other hardening measures. We also provide a secure supply chain from factory to field to prevent vulnerabilities within hardware, firmware, BIOS, or other aspects of the solution.

Learn more about AHEAD's comprehensive set of services to implement your fleet of industrial edge devices faster and more efficiently. [Contact us](#) about implementing your large-scale industrial edge solution to improve rail safety and operations.

AHEAD

AHEAD builds and manages digital platforms that power the most successful organizations in the world. Our consultative approach, unmatched engineering, and innovative solutions combine to accelerate the impact of technology for every client we serve.

National Hubs

ATLANTA

1117 Perimeter Center
W406
Atlanta, GA 30338

CHICAGO

401 Michigan Ave.
#3400
Chicago, IL 60611

SAN FRANCISCO

2000 Crow Canyon Place
Suite 250
San Ramon, CA 94583