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How AI in the Freight Rail Industry Is Improving Safety

by

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I. Introduction and Summary

Artificial Intelligence (AI) is expected to fundamentally transform virtually every sector of the economy, as did electricity, the telephone, and the Internet. At its core, AI enables dramatic improvements in three areas: 1) rapid transfer of large amounts of data, 2) processing that data by powerful computer models, and 3) acting on the model results, often without human intervention.

Different firms and sectors have implemented AI differently. One of the most interesting is the freight rail industry. Despite its nearly 200-year history, the freight railroad industry has banded together to implement one of the nation's most sophisticated sensing systems to lower costs and increase safety.¹ But rather than being rewarded for this advancement, the industry faces pressure to avoid cutting jobs that are no longer needed. Faced with a choice between safety and jobs, regulators have sometimes chosen the latter.

Although technology is creating the potential to increase automation and safety in many markets, its implementation is often slowed by regulations from a previous era. Regulators, who are often

¹ Joseph V. Kennedy, "Using Communications Technology to Enhance Safety: The Freight Rail Market's Proactive Approach," *Perspectives from FSF Scholars*, Vol. 21, No. 24, May 18, 2026, <https://freestatefoundation.org/wp-content/uploads/2026/05/Using-Communications-Technology-to-Enhance-Safety-The-Freight-Rail-Markets-Proactive-Approach-051826.pdf>.

more comfortable with the certainty of old technology than the promise of the new, may give less emphasis to productivity and innovation than they deserve. This is certainly true regarding the freight railroad industry where railroads have been leaders in implementing continuous safety improvements. They have voluntarily implemented a number of technologies, including, for example, "hot boxes," which measure the temperature of each wheel and bearing on a passing train.

II. Freight Rail's Investment in Technology and Safety

Freight railroads operate under a self-governing framework led by the Association of American Railroads (AAR). This self-governing model allows stakeholders to set high standards, share safety data, certify suppliers, and update rules faster than regulators can. The AAR uses a variety of processes to maintain standards among its members. These include interchange agreements between members, peer-reviewed standards, audits, real-time data collection, and standing committees. The railroads' efforts have led to several exciting present and future technologies, including wheel temperature-detection systems, wheel impact load detectors, acoustic bearing detectors, truck hunting detectors, and machine vision systems.²

These efforts are paying off in the form of a significant and prolonged decline in the number and cost of accidents. Recent data reaffirms the trend toward greater safety. Although freight accidents still infrequently occur, almost all statistics show long-term, significant improvement in safety. Not only is safety improving for freight railways, but data also show that railroads enjoy a healthy lead in safety over their main competition, the trucking market. The railways attribute this to continual private investment (\$23 billion annually), utilization of advanced technologies, and constant workforce training.

III. The Fear of Job Loss

Despite this, the fear of job losses sometimes causes railroad regulators to deter this technology. By imposing labor costs that may no longer be needed, federal rules sometimes reduce the railroads' incentives to implement better safety equipment. Remember that in some cases the work involved cannot be done by a human, who would have to process large amounts of data, analyze it using sophisticated models, and react instantly.

One example of the preference for jobs involves the minimum crew size. Presently, the freight standard in the U.S. is for two-man crews. Railroads would like to implement one-person crews on a route-by-route basis but regulators and the union are attempting to forbid it. In fact, one-person crews already operate on certain freight routes. It is also the industry standard for U.S. passenger routes and in Europe, even though in the latter, rail systems are more complex.³ The Federal Railroad Administration (FRA) has admitted that there is no evidence that two-person crews are safer.

² American Association of Railroads, "How Freight Railroads Use Technology," <https://www.aar.org/freight-rail-tech>.

³ Joseph V. Kennedy, "Mandated Crew Sizes Don't Make Trains Safer," *Perspectives from FSF Scholars*, Vol. 21, No. 16, April 9, 2026, <https://freestatefoundation.org/wp-content/uploads/2026/04/Mandated-Crew-Sizes-Dont-Make-Trains-Safer-040926.pdf>.

Another example involves inspections. The significant investment of sensors, including in remote areas, makes it possible to detect problems earlier, including in places where inspectors cannot go. Railroads have petitioned the FRA for a waiver of visual inspection frequency requirements. Railways argue that autonomous track measurement systems, including sensors that continuously collect real-time data, detect and analyze data much faster than periodic manual inspections. The FRA has resisted providing these waivers and recently proposed that waiver applications must demonstrate that their proposed changes would not eliminate jobs.

IV. Conclusion

The freight railroad industry has been a leader in the implementation of AI technology to transport, analyze, and act on large amounts of data. The result is often an increase in both profits and safety. But in some cases, the result will be a decrease in the number of routine jobs as workers move to more skilled work such as learning how to use the data to increase long-term safety. This spurs both faster economic growth and higher incomes. It should be welcomed, not feared.

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