

# RAILROAD WEEK IN REVIEW

June 23, 2023

*“You’ve read elsewhere about ChatGPT and Artificial Intelligence — whether AI is a threat or a tool to enhance everything from medical science to manufacturing. On UP, it’s a tool supporting more than 7,000 wayside detection devices covering some 32,000 miles of railroad. Using AI and machine learning, UP manages the collected data to find equipment that’s in the process of failing before it actually fails.” — Week in Review, June 9*

**Artificial Intelligence (AI) and ChatGPT** have been very much in the news and on financial websites of late. So when I saw the UP note on AI in the context of wayside detectors, I decided to see where else AI is being used in the railroad environment. What follows in italics is straight from ChatGPT. My comments are not italicized.

*Union Pacific utilizes artificial intelligence and advanced technologies in various aspects of its operations. The company has been incorporating AI to enhance efficiency, safety, and decision-making in rail transportation. AI algorithms can analyze large volumes of data to optimize train schedules, predict maintenance needs, and improve fuel efficiency.*

*Additionally, Union Pacific employs AI-based systems for monitoring and detecting potential safety hazards, such as track anomalies or equipment malfunctions, to prevent accidents and ensure the smooth operation of their trains. These AI-driven applications help Union Pacific streamline their operations, improve reliability, and enhance overall rail transportation services.*

**Drilling deeper into AI applications** on the railroad, ChatGPT says *AI technologies have significant potential for improving operations and efficiency in the railroad industry.* Here are a few areas where AI can be applied:

*1. Predictive Maintenance: AI algorithms can analyze data from sensors and systems installed on trains to detect potential equipment failures and perform predictive maintenance. This helps reduce unplanned downtime, optimize maintenance schedules, and enhance safety.* This goes directly to Hunter Harrison scheduling track maintenance projects on the IC in the 1990s.

*2. Traffic Management: AI can be used to optimize train scheduling and traffic management, taking into account factors such as train speeds, timetables, track capacity, and weather conditions. This can improve the overall flow of train operations, minimize*

*delays, and enhance network efficiency. See also CN's prohibition of "no-fitter" trains — those that are too big for passing sidings between OD pairs.*

*3. Autonomous Trains: AI technologies, including computer vision and machine learning, can enable the development of autonomous or semi-autonomous train systems. These systems can monitor tracks, signals, and surrounding environments, allowing for safer and more efficient train operations. The UP wayside detector example is one such application.*

*4. Energy Efficiency: AI algorithms can analyze energy consumption patterns and optimize train operations to minimize energy usage and reduce emissions. This can lead to significant cost savings and environmental benefits. Data from the locomotive's LEADER® (Locomotive Engineer Assist / Display & Event Recorder) train control and energy management system could feed a railroad's AI program, for example.*

***Implementing AI in the railroad industry*** requires a combination of data collection, analytics, and integration with existing infrastructure. It's important to ensure robust cybersecurity measures and regulatory compliance when implementing AI technologies in this sector. That said, I asked ChatGBT about railroad transit times:

*The transit time for a boxcar of paper from Portland, Maine, to Atlanta, Georgia, can vary depending on several factors, including the specific route, rail network congestion, and the service level chosen. As an estimate, it typically takes around five to seven days for a rail shipment to travel this distance. Inquiries like this can help customers manage their supply chains. Here, one could ask the CSX sales rep to confirm.*

*Factors such as the availability of direct rail connections, any required transfers, and the overall logistics planning by the railroads in the route can also influence the transit time. Working closely with one's serving railroad allows one to get the most accurate and up-to-date information for the specific shipment.*

As for preventive maintenance, the 92-day locomotive inspection plays a major part. But I'm hearing that crews are being allowed less and less time to do them. I asked ChatGPT how long doing the 92-day inspection ought to take.

*The 92-day inspection on a locomotive refers to a comprehensive maintenance and inspection procedure performed approximately every 92 days or three months. The exact time required to complete the inspection can vary based on several factors, including the locomotive's model, size, complexity, and the specific maintenance program of the railway company.*

*Typically, a 92-day inspection can take several days to complete, ranging from a few days to a week or more. The inspection involves a thorough examination of various components, systems, and subsystems of the locomotive, including the engine, brakes, electrical systems, couplers, and safety features.*

*During the inspection, technicians will inspect, test, repair, and replace any worn or faulty parts, perform necessary maintenance tasks, and ensure compliance with safety standards and regulatory requirements. The goal is to identify and address any issues to maintain the locomotive's optimal performance, reliability, and safety.*

*The duration of the inspection can also be influenced by factors such as the availability of maintenance facilities, the complexity of repairs or replacements needed, and the coordination with other ongoing maintenance tasks. In other words, managers ought not to be telling shop craft personnel how many minutes they have to do a 92-day.*

**But let me conclude** with a cautionary note. ChatGPT itself warns of its limitations. The big one is how one can tell whether the ChatGPT response is accurate because *AI is a large language model (LLM) designed to understand and generate human-like text based on the input it receives.*

*These models are trained on vast amounts of text data and utilize deep learning techniques to learn patterns, grammar, and context. But garbage in, garbage out. The user has to know enough about the subject at hand to tell what's real and what's made up in order to detect examples of GIGO.*

*Chat GPT models have a wide range of applications, including language translation, content generation, customer support, creative writing assistance, and more. They are continually improved and updated to enhance their capabilities and provide more accurate and helpful responses. My boxcar of paper above is one example of a customer support application. But above all, beware the GIGO factor.*

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