BEFORE THE U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

DOCKET NO. FRA-2024-0126

CSX Petition for Approval of Product Safety Plan

March 17, 2025

These comments are on behalf of the Transportation Division of the International Association of Sheet Metal, Air, Rail and Transportation Union (SMART-TD), an organization representing approximately 100,000 transportation employees with active rail members working in all operating crafts, including engineers, conductors, trainmen, switchmen, hostlers, and yardmasters.

SMART-TD recognizes the profound impact this decision will have on the safety and well-being of our members and the freight rail community at large. With Wabtec's Trip Optimizer currently in use on three of the nation's largest four Class I railroads, the ruling on this matter will set a significant precedent for the entire industry. The ramifications of this decision extend well beyond CSX, affecting railroads and the employees operating across the country. This decision will set the tone for future technology integration on freight rail systems and the safety of all rail employees and the communities in which we operate.

In that spirit, SMART-TD has undertaken a comprehensive effort to gather feedback from the front-line workers, the railroaders who will interact with and rely on the Trip Optimizer system on a daily basis. We understand that their experience is crucial in evaluating the true efficacy and safety implications of this technology.

Though my name (National Safety and Legislative Director Greg Hynes) and signature will appear at the end of this public comment, it is important to emphasize that the concerns raised here are representative of the collective voice of thousands of our most qualified field experts. These railroaders have hands-on experience with Trip Optimizer, and their insights are both invaluable and, as demonstrated below, overwhelmingly negative regarding the software's current capabilities and reliability.

SMART-TD Survey Overview

To better understand the concerns of our members, SMART-TD utilized a third-party polling firm to solicit input on their experiences with Wabtec’s Trip Optimizer. The survey results highlight a disturbing level of dissatisfaction and concern regarding the system’s performance and its potential for expanded use as proposed in CSX’s Public Safety Plan.

This voluntary survey was designed to capture the experiences and opinions of rail professionals who operate under the conditions set by this technology every day. The depth of the responses and the clarity of our members’ concerns cannot be overstated.

SMART-TD Trip Optimizer survey conducted March 5-9 by DFM Research (independent contractor) consisted of 2,727 respondents with a margin of error of plus/minus 1.9 percentage points. Reported results weighted by age, membership classification and railroad to conform with the full universe of SMART-TD conductors and engineers on active status. Survey was conducted online, with all SMART-TD conductors and engineers with an email or mobile number on file contacted multiple times during the five-day time span. A restrictor was in place to ensure each member could participate only once. Past research shows that SMART-TD online surveys weighted to conform with full membership demographics are well within the margin of error of membership random phone survey.

Results Speak for Themselves

In one of the most telling questions, "Do you have a favorable or unfavorable view of Trip Optimizer," 72% of respondents expressed an unfavorable opinion of the technology. Less than 10% expressed any form of favorability. These results speak volumes about the lack of confidence rail workers have in the system, which is alarming given the potential safety ramifications if it is granted expanded use.

To further break down this response, the majority of respondents marked their views as "Very Unfavorable" (29%) or "Unfavorable" (26%). This is a clear signal from the very individuals who interact with the Trip Optimizer daily that the technology, as it stands, is simply not meeting their expectations or safety requirements.

Conversely, only 1% of respondents had a "Very Favorable" view, and 3% expressed a "Favorable" view. Given that these numbers represent railroaders who are intimately familiar with the technology, this overwhelming sentiment of dissatisfaction must be taken seriously by the FRA in its deliberations on the matter.

Reliability and Performance Issues

One of the most troubling results from the survey concerns the reliability of the Trip Optimizer system. A staggering 91% of respondents reported having experienced a failure of the Trip Optimizer system, with 89% experiencing enroute failures. These are not minor inconveniences. These are failures that can jeopardize the safety of the crew, the train, and the communities through which they travel.

Equally concerning is the response to the question, "Has Trip Optimizer relinquished control back to the engineer while in motion?" A full 91% of respondents confirmed that this has occurred, with only 2% stating that it had not. This is a major safety issue, as the system is supposed to assist the crew in operating the train within safe parameters, not unpredictably disengage, forcing the crew to take emergency actions without prior notice.

The reliability of the system is further called into question when respondents report experiencing complications between the Trip Optimizer and Distributed Power Units (DPUs). 71% of respondents noted experiencing problems with these units, which are becoming increasingly more common as trains grow in length. Such failures have significant safety implications, particularly in mountainous terrain or during emergency situations. A mere 10% of respondents stated they had not encountered TO having problems communicating with the DPU.

The issue of control is compounded by reports of the system struggling to decelerate or bring a train to a stop. 82% of respondents indicated that the Trip Optimizer had difficulty slowing down or preparing to stop the train when necessary. This creates significant risk, especially when encountering unforeseen track conditions or an abruptly unfavorable signal progression.

An even more alarming concern is the frequency of overspeed incidents while the Trip Optimizer is engaged. 64% of respondents reported experiencing overspeed conditions, further exacerbating

the risk of train accidents. This kind of malfunction is unacceptable and highlights a fundamental flaw in the system's design and functionality.

Safety Concerns and Rule Violations

Compounding the thousands of our members' eyewitness accounts of experiencing TO violating speed restrictions, another key concern identified in the survey pertains to the TO's methodology of train handling. 45% of respondents reported that Trip Optimizer had violated Air Brake Train Handling (ABTH) or other operating rules. Such violations are in direct conflict with the fundamental principles of safe train operation and the well-established rules that railroaders are trained to follow. Instructors at the CSX training center in Atlanta, Georgia pound into the heads of newly hired conductors across their system; every rule in the books they are given is written in blood.

That is to say that each one of these rules is important, and they have become rules based on knowledge learned the hard way by CSX and the rail industry in general. In light of this harsh reality, SMART-TD cannot help but point out the hypocrisy that this railroad is not only turning a blind eye to the rules violated by Trip Optimizer, (of which they are fully aware) but they are asking FRA for the opportunity to expand the role of this obviously flawed technology.

Not only is CSX asking to expand the role of TO, but in TO ABC, they are placing control of the automatic brake under its control. TO having this capability is an extraordinary force multiplier that will compound the rule violations it is known for to an unacceptably dangerous level.

Engineer Atrophy And De-Skilling

The question of whether the Trip Optimizer system diminishes the skill set of engineers is worth highlighting. A resounding 90% of respondents agreed that the Trip Optimizer reduces their skill set and ability to operate a train, with 66% stating that it diminishes their skills "a lot." This is not a minor concern. It strikes at the heart of what makes railroading such a highly specialized and safety-critical profession. Engineers are responsible for making split-second decisions, and the de-skilling of our workforce undermines the very safety measures that are built into the training and experience of our members.

The aviation industry has reviewed and addressed this issue on several occasions since the implementation and subsequent use of onboard autopilot systems[1][2]. Their findings are that a reliance, to any degree, on automated or automated-like systems results in the skill degradation of a pilot. There is no reason to believe that there would be no correlation to other modes of transportation, including rail. In fact, maritime operations do not permit the use of automated-type systems unless the vessel masters and pilots determine it is safe to do so.

Locomotive engineers need to know how a train is going to handle or react in order to properly respond in an emergency situation. TO ABC prevents this knowledge from being ascertained. Approaching a stop signal, an obstruction, another train, a grade, or a human being is not the appropriate time or moment for an engineer to get a *feel* for their train. That is the moment they

[1] FAA Safety Alert for Operators 13002
[2] FAA Safety Alert for Opertors 17007

should know how to account for these priorities and control their train most safely, but because of Zero-to-Zero, that will be nearly impossible. This is especially concerning when you consider that the survey reveals that TO most commonly *cuts out* or fails at the moments of greatest risk.

Trust and Confidence in Trip Optimizer

The lack of trust in Trip Optimizer as a fully autonomous system is another critical issue raised by our members. An astounding 90% of respondents expressed discomfort with trusting the system to operate autonomously, with a large majority of 69% indicating they were "very uncomfortable" with the idea. Only 8% expressed any comfort with the system, and just 1% felt "very comfortable." Given that these railroaders are using the system on every trip they work, it is clear that the current version of Trip Optimizer does not instill confidence in its ability to safely operate a train, particularly when it comes to critical safety functions such as air brake application and speed regulation.

The proposal to expand the use of Trip Optimizer as a fully autonomous system is met with overwhelming opposition from our members, who have well-founded concerns about the risks it poses to their safety and the safety of the general public. The lack of trust is rooted in tangible, real-world experience with a system that has repeatedly demonstrated its failure to perform as intended.

The Inconsistency and Failure of Training

The survey responses also highlighted significant concerns with the quality and consistency of training provided to railroaders on the use of the Trip Optimizer. Alarmingly, 32% of respondents indicated they had received no training at all on the system. As this is the best and most readily available indicator of how CSX would handle a rollout of the new system, we as a union, cannot and do not trust this or any railroad to properly train our rail members on the proper use of TO's expanded capabilities.

Of those who did receive training, many reported that it was inadequate. 19% only received a job briefing and handout, 17% received a brochure or job aid, and 19% reported learning about the system only through word of mouth. Such inconsistent and inadequate training cannot be tolerated, particularly when the safety of both railroad employees and the public is at stake. With the air brakes being the most important and complicated safety apparatus on a freight train, it is incomprehensible to entrust CSX to prepare it's workforce to properly oversee this newly advanced system.

Cyber Vulnerability

In September of 2023, the Norfolk Southern Railroad was crippled when a large percentage of its computer capabilities were rendered unusable simultaneously. NS does not use Trip Optimizer technology, but the comparison here remains valid.

NS lost control of its signals, PTC, its LEADER program (equivalent to TO but from a company other than Wabtec), Dispatcher displays, system-wide email servers, and even automatic switches. When this occurred, SMART-TD is proud to be able to say that the saving grace of this nation's

supply chain and the public safety of the eastern half of our country were the skills of our nation's railroaders. In the chaos that ensued at the onset of the outage, our professionals assessed their individual situations, noted inconsistencies, and brought their trains to a stop without incident. Not one stop indication or work authority was violated. In the case of many of these NS trains, the air brakes played a vital role in avoiding tragedy.

By giving TO access and control over the automatic braking systems of CSX trains, we unnecessarily open the door to having a much different and more tragic result the next time this occurs.

SMART-TD cannot state as fact that giving TO ABC access to the air brakes will negate the possibility of our engineers being able to perform similar heroics when the computer systems go down; however, neither CSX nor Wabtec can honestly guarantee that they would. The role of FRA has always been an unrelenting push to eliminate risk caused by unforeseen consequences. If FRA grants this product safety proposal, and engineers are proven incapable of preventing the next disaster, this would be the exact opposite. This proposal introduces a highly foreseeable consequence that has untold potential to cause mass fatalities.

It is simply unacceptable.

In the case of the 2023 outage experienced by Norfolk Southern, there was never a publicly stated causation. This being said, even if it was not created by an outside bad actor, it undoubtedly caught the attention of those who would wish harm to our supply chain, economy, and public safety.

We, as a union, and our country as a whole, cannot responsibly turn a blind eye to this reality. It is irresponsible to create corruptible connective tissue between corruptible computer systems and our air brakes.

Crew Control Over Safety

In the Product Safety Proposal, CSX submitted to FRA as part of Docket No. FRA-2024-0126, it is stated that while the TO ABC has control of the locomotive and the train consists, the crew on board maintains the ability to bring the train to a stop by engaging the emergency brake.

It goes without saying that using a train's emergency brake is not the safest or most efficient way to bring a consist to a halt. Depending on a train's makeup, the state of the slack in the train, track curvature, topography, and track conditions at the time stopping is deemed necessary, engaging the emergency brake drastically increases the chance of the train derailing. CSX instructs its crews in many places in its own rules that in cases of dropped signals, inevitable collisions with pedestrians, and other emergencies, the correct course of action is to avoid putting the train in the emergency and bring the train to a controlled stop using proper train handling techniques.

By giving our locomotive engineers a binary choice of applying the emergency brake or being at the mercy of TO ABC, exacerbating the situation they find themselves in, CSX will be stripping these men and women of the ability to do just that. There is a reason railroads instruct their crews not to use the emergency brake flippantly. Applying the emergency brake and subsequently

derailing can cause more of a threat to the crew and the community than the issue that necessitated emergency action.

This risk is completely unnecessary. It is the equivalent of going golfing and failing to take any club but the driver. The emergency brake is by no means a one-size-fits-all solution for every scenario where a train crew may need to override TO. Dumping the train or putting it in emergency is a last-ditch, drastic measure that carries with it known risks and consequences. Our professional railroaders know the course they are playing, and to succeed, they should have access to every iron, wedge, and putter they need to expertly navigate the course as they have been doing since the 1800s.

Will Our Trains Stop

Our union sends daily communications to our rail and bus members. In preparation for making productive and fact-based public comments on this PSP, SMART-TD sent a request directly to our membership requesting they reach out to our National Safety and Legislative Department regarding their interactions with Trip Optimizer.

Their responses generated more than one reoccurring theme. Their anecdotal evidence formed many of the questions that made up our third-party survey. Perhaps the most alarming of all of these issues was the ominous evidence they gathered on TO ABC's accuracy in calculating how to use the air brakes to slow their trains effectively.

As a precursor to TO ABC, CSX has recently "upgraded" its current Trip Optimizer software to include what is referred to as Air Advisements. These advisements tell the crew how many pounds of automatic brake pressure to apply and counts them down to when they should apply the prescribed amount of air. Our members who work on BNSF and Union Pacific properties also have air advisements as part of the TO program on their engines.

Clearly, these air advisements are a direct indication of how the TO ABC will, in fact, operate our trains. Should FRA grant this PSP, this advice to the engineer on how to operate the automatic brake will turn into the direct actions of this new autonomous system.

With this in mind, SMART-TD's engineers are here to tell you that it will be an unmitigated disaster.

Several of the members who reached out to us gave blow-by-blow accounts of how they followed the Air Advisements exactly, only to realize that the brake power applied was not going to slow their trains down enough or in time. Fortunately, for now, when TO's flaws are in the form of suggestions, the engineers were able to compensate for the poor train management of TO's new system and were able to add additional braking to accommodate for the shortcomings of Wabtec's calculations.

In the brave new world CSX is requesting to form with this PSP, it will not be that easily done. The stakes don't get much higher than when you gamble on whether or not a freight train will get stopped before a disaster occurs. One failure of this scope is too many; however, based on the statistics gathered in our third-party survey, these catastrophes will not be isolated incidents.

In one question that is at the heart of our rail members' concerns over this PSP, we asked, “Have you experienced any incidents where you applied the automatic brake consistent with Trip Optimizer air advisements and the braking power proved to be less than adequate for the situation at hand?”

Of those members who have had TO offer air advisements, 62% of them responded that they have had the air advisement fall short of slowing the train in time to meet the moment. This is nothing short of empirical evidence that this program is far short of being ready to be deployed on America’s mainlines.

Failure Mode and Effects Analysis

When rolling out new products or procedures, many American industries apply a common process failure evaluation strategy known as Failure Mode and Effects Analysis (FMEA), of which safety is a large factor. In this process, a group of multi-disciplined experts identify every aspect that could possibly go wrong with the new product. They then take this list of potential failure modes and analyze each individually. In simple terms, this is done by first calculating the frequency they can anticipate a failure mode occurring and then compounding it by the ramifications of its consequence.

In the case of TO ABC or any new product in the rail industry, this school of thought can go a long way toward the safety of our men and women. The consequences of failure for TO ABC are the death of crews, mainline derailments, and hazmat spills, all the way down to the more mundane failures of blocked crossings or hitting a 30 mph crossover at 31mph. Injuries and death being part of the foreseen consequences is a seemingly insurmountable burden of proof for CSX, Wabtec, or FRA to say this is all worthwhile.

It is evident with the long list of issues our members have with TO in its current state that CSX and the other railroads using TO either did not employ FMEA strategies or rail safety does not act as the same deterrent to them as it does to America’s railroaders, SMART-TD, the communities our tracks run through, or presumably the FRA.

We know TO and TO ABC are prone to many types of critical failures, and 160 years of institutional memory have taught us the ramifications of these exact failures in train handling. There is no possibility of these risks being justified by CSX’s fuel savings, which is the only benefit they presented in their Product Safety Plan.

Conclusion

In light of the overwhelming survey results and the deeply rooted/valid concerns voiced by our members, SMART-TD strongly opposes the approval of CSX’s proposed Product Safety Plan and any expansion of the Trip Optimizer’s role in train operations. The technology, in its current form, poses a significant safety risk to railroaders, passengers, and the public. The failures reported by our members, ranging from inconsistent performance to outright malfunctions, demonstrate that the Trip Optimizer is not yet ready to be relied upon for critical safety functions, such as air brake application.

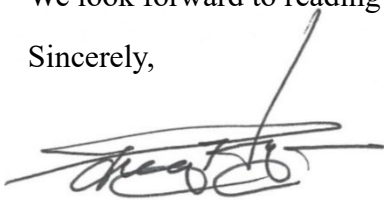
Our members, who are the true experts in this matter, as well as being the men and women whose lives and limbs will be directly put on the line, have made it abundantly clear that they do not trust Trip Optimizer to operate as a fully autonomous system. The safety of our railroaders, the communities we serve, and the broader public cannot be sacrificed in the name of technology that has yet to prove itself reliable, consistent, and safe. In short, our members are not lab rats or crash test dummies.

We urge the FRA to reject CSX's request for approval of this Product Safety Plan and to prioritize the safety and well-being of our nation's railroad workforce and the general public. Until Trip Optimizer Air Brake Control can meet the safety standards and reliability expectations of the railroaders who will operate it, TO should not be permitted to play an expanded role in the operation of our trains.

As always, SMART-TD is happy to have the opportunity to participate in this important public comment process. It is our sincere hope that our objections along with the care and effort that went into the process of gathering fact rather than speculation is apparent in our comments.

We look forward to reading the outcome of FRA's decision on this matter.

Sincerely,



Greg Hynes
National Legislative Director