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## REGULATING RAIL TECHNOLOGY

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### INTRODUCTION

**A**merica's railroads form the core of the nation's long-distance freight infrastructure. Trains are the mode of choice for those shipping goods between one and two thousand miles, and they compete with trucks for loads moving more than 500 miles and waterborne vehicles for loads moving across the continent.<sup>1</sup> But, unlike road and water freight, private corporations operate and maintain the vast majority of rail rights of way, under the watchful eye of regulators at the Federal Railroads Administration.

In this competitive transportation environment, companies and industries must innovate to ensure that the loads upon which they subsist keep coming. Admittedly, this has become more difficult, as there are not that many monopoly profits from "captive shippers"<sup>2</sup> these days in a world of ubiquitous truck transportation,<sup>3</sup> and the share of freight moving by rail is well off highs from a century ago.<sup>4</sup> Innovation in railroads means moving more goods faster, with fewer safety issues, all while keeping costs down and shipper prices in line with other modes. Yet innovation in transportation industries is usually, but not always, a politically rife issue, especially when new technologies threaten to change the nature of industry labor.

Last year, in cooperation with TechFreedom, R Street published its "Barriers to Innovation and Automation in Railway Regulation" study, which addressed the recent history of the changing nature of federal and state regulation with respect to rail transportation.<sup>5</sup> In the year since then, railway innovation continues apace, with news of new technologies, new research and new regulatory questions surfacing in the public discourse. Accordingly, this study will highlight the most important of these developments, and analyze potential public policy responses they bring. Put generally, it finds that a robust federal role that can adapt to changing railway technology is better suited to the protection of interstate commerce than a patchwork of state limits and mandates applied to transportation firms.

### WHAT'S UP AND COMING IN RAILWAY SAFETY TECHNOLOGY

In recent years, the biggest story in railway technology has been the federal mandate for an industry implementation of Positive Train Control (PTC) technology that prevents trains from exceeding speed limits, and helps to avoid train-to-train collisions, both head-on and when simply moving in the same direction. This technology has not come cheaply, and meeting 2020's implementation deadline<sup>6</sup> has proven to be a challenge for some, especially for state-level passenger railroads.<sup>7</sup> But PTC technologies have helped lay the groundwork for railroads to use new devices, sensors and analytical techniques to make rail infrastructure and vehicles better. For instance, early data from a major railroad indicates that PTC has increased the reliability of railway signals even without further advanced technologies.<sup>8</sup> Once complete, the system will also allow railroads to operate with "moving block" scheduling that keeps distance between trains regular, rather than "fixed block" scheduling, which allows only one train in on a predefined section of track.<sup>9</sup> Moving block technology has long been a best practice with subways around the world, and it is an efficiency upgrade from fixed block scheduling that's facilitated by more-reliable, network-connected and ubiquitous railroad signals and switches. As time passes, it will allow railroads to run more trains on the same tracks, making shipping times more reliable, saving money and giving everyone a better picture of where goods are in real time.<sup>10</sup>

PTC and related technologies are only the most recent developments in the mechanization of railway work that have steadily moved workers out of harm's way over the last century. And, in the next few years, this process will continue—if not accelerate—barring intervention from legislators or regulators. The prospect that railroads and their unions will negotiate labor agreements that move staff outside locomotive cabins and into remote operation centers and road-based vehicles is on the horizon and moving closer by the year.

Increasing railway worker safety has also led to advances outside the vehicle as well. Safe operation of trains alone does not prevent hazards that stem from defective or worn-out track, ties, ballast or wayside infrastructure. These issues are the second leading cause of derailments.<sup>11</sup> In the past, inspecting this infrastructure was a labor intensive process that required shutting down the track and having maintenance workers on foot or in hi-rail trucks check for issues visually.<sup>12</sup> However, this kind of downtime on tracks is expensive for the railroad, and manual inspection opens the door for human error that puts others in danger. To improve this process, engineers have developed devices<sup>13</sup> that can be installed in railroad locomotives or can use track geometry cars to monitor track and infrastructure conditions in real time.<sup>14</sup> Throughout 2019, BNSF railroad, for example, conducted a test of alternative inspection methods<sup>15</sup> on part of its network after earning a temporary exemption from the relevant federal regulation.<sup>16</sup> The results of this test will inform future decisions about whether and how to allow automated inspection to replace the manual visual processes now required by law.

Aside from locomotive driving and infrastructure problems, railroad safety hazards can result from the rolling stock itself. Broken parts on cars or locomotives can mean broken trains. It is hard to stop a train with an air brake when the tubes that carry the air have rattled off. The current solution to this is mandatory manual inspection and regular testing. However, this means people on the ground and the omnipresent potential for human error that comes with reliance on such a mechanism. To avoid these hazards, railroads have developed automated inspection tools that can be installed on working rail lines. When trains pass through, high-speed cameras linked to computers take pictures of the sides, top and undercarriage of each car, software then evaluates the images for anything that looks out of place. In 2019, Class I railroad CSX began using such a technology,<sup>17</sup> a year after the Canadian National railroad began using a similar technology north of the border.<sup>18</sup> Moving forward, we can expect expansion of these rail car inspection devices across American rail networks.

## REGULATING RAILWAY TECHNOLOGY: 2020

The end of 2020 will close a five-year chapter in American railroad regulation that has seen the expansion of PTC technology nationwide, pushes toward more efficient safety testing and an exhaustive study of matters related to railway staffing. The following sections briefly outline the current status of each.

**PTC Implementation**—As the deadline to implement PTC approaches, FRA regulators have made clear that there will be no deadline extensions or rule exceptions. In anticipa-

tion of this, railroads that expect to miss the deadline were warned more than 18 months in advance.<sup>19</sup>

**Safety Testing**—The FRA has also begun efforts to improve the regulation of track and brake inspections. On December 31, 2019, it issued an NPRM to revise railroad track safety requirements.<sup>20</sup> This rule would allow continuous rail testing for track inspection nationwide, as well as change a variety of technical inspection rules. Once completed, vastly more efficient infrastructure inspections will be possible, and Americans will benefit from safer, more reliable railroads that inspect their infrastructure more often and with more precision than manual inspection allows.

Also in December 2019, the FRA issued a second NPRM that would alter rules related to train brake testing. The rule would codify longstanding waivers for niche testing situations and, more importantly, extend how long a car's air brake lines may be disconnected before triggering a new inspection from four to 24 hours. The FRA's regulatory analysis found these proposed changes would generate cost savings of about \$70 million per year.<sup>21</sup>

In a final equipment safety development of note, the FRA issued notice in January 2020 that California public passenger railroad Caltrans is seeking regulatory relief for a unique and currently noncompliant door design on some of its recently purchased rail cars.<sup>22</sup> Typically, such a notice would be irrelevant to policy analysis, but as the above rules that build on preexisting waivers show, exceptions to regulations can sometimes become the rule and thus the FRA could follow a similar path with railway door regulations.

**Staffing**—In 2016, the FRA issued a Notice of Proposed Rulemaking (NPRM) that sought information about the safety implications of rail staffing levels that would support the setting of federal standards for minimum locomotive crew sizes.<sup>23</sup> Three years later, in May 2019, the FRA withdrew the rulemaking, citing a lack of evidence that two-person locomotive crews made railroads safer.<sup>24</sup> This was an affirmative decision not to regulate,<sup>25</sup> analogous to the decision by the Federal Motor Carrier Safety Administration's decision affirmatively not to change maximum service hours for trucks eight years earlier.<sup>26</sup>

In the years between when the rule was promulgated and when it was withdrawn, the prospect of single-member onboard locomotive crews provoked powerful reaction from politicians at the state and federal level. Between 2016 and early 2019, lawmakers in five states passed laws that set their own limits on how many people must be onboard, and many more considered them. Ultimately, however, pursuant to its authority as the nation's legally designated regulator of railway safety, the FRA's decision overturned these limits on the grounds that, since there was no evidence that a second per-

son in the locomotive cab made trains safer, any such state regulation did not have a legitimate safety rationale.

Indeed, without evidence of public benefits from safer trains, laws like these amount to simple protectionism, as lawmakers are mandating a particular job be maintained despite technological advances and billions of dollars in PTC infrastructure investments.

However, this has not stopped some lawmakers from arguing the alternative. A bill introduced in 2019, for example, would amend the “Particular Aspects of Safety” chapter of the U.S. Code to mandate that every train have both a licensed locomotive operator and a certified train conductor, without exception.<sup>27</sup> This lack of exceptions is even more onerous than most of the now-overturned state laws, which typically allowed a single operator to conduct low-speed tasks such as car switching within rail yards—an action that is already normal in functionally similar passenger subway rail yards.

## RECOMMENDATIONS

The Constitution granted Congress the power to regulate interstate commerce more than two hundred years ago. In the time since, the courts have affirmed that role, making clear that where state and federal law are inconsistent, state law is superseded when it substantially interferes with interstate commerce.<sup>28</sup>

Then and now, railroads have been important arteries of America’s interstate freight network, and states have incentive to protect local jobs—even at the cost of a less competitive national economy, higher costs for shippers and less private investment in the nation’s freight infrastructure. Nevertheless, the motivation to protect and grow an ever-more-interconnected American economy gives Congress reason to exercise its interstate commerce regulation mandate.

With its staffing rule withdrawal, the FRA took one justification for crew-size regulation from state legislators, but did not go so far as to bar states from passing railroad staffing rules altogether. Should a state move forward with another reasoning, it is ambiguous whether the FRA currently holds the power to step in. For instance, many transportation regulations differ between states, and may interfere with interstate commerce on some level. For example, a state could pass a crew-size mandate with an explicit goal of “preserving local jobs,” and it is unclear if the existing regulatory regime would prevent such a move.<sup>29</sup> Removing this ambiguity would bring valuable certainty to railroads and those that rely on them.

This can be done in three ways. First, the FRA could promulgate a rule that affirmatively codifies sole federal authority

over matters of railway staffing under the existing “R3” act.<sup>30</sup> Second, Congress could pass an analogous but opposite law to the existing federal proposal to set minimum crew sizes. The law could affirm the authority of railroads to independently negotiate with their workers on matters of railroad staffing. Alternatively, it could set ‘zero’ as the statutory federal crew size, while barring states from passing their own railroad staffing regulations.<sup>31</sup> The primary benefit of this method is that it would be particularly easy to understand and explain through a plain reading of the Commerce Clause. Third, states could pass their own rules that set low limits for train crews, making clear to railroads that it is safe to invest in new or improved service without fear.

On matters related to track testing and brake inspections, the FRA is already on the right track. The agency is well aware of the potential benefits that continuous track testing and longer brake inspection windows will have for railroads and the American consumers who rely on their services. Notably, changes to the air brake rule will mirror Canadian regulation in that it will allow 24 hours off-air before triggering an inspection.<sup>32</sup> In this case, improved railroad safety regulations will both facilitate American interstate commerce and be a small step toward a better-integrated and more-efficient North American transportation network.

The track testing and brake rule NPRMs lend credence to the FRA’s practice of creating a regulatory pathway for new technologies with pilots, waivers and judicious use of rule exceptions. They are a sign that the railroads and the government can reliably negotiate opportunities to test devices and methods that promise to make railroads safer. While successful, these waivers and pilots may move too slowly for some legislators’ liking. As such, new laws could be passed that pull regulatory methods and concepts from other areas of transportation regulation, such as that of automated cars and trucks.<sup>33</sup> This is particularly important when it comes to the potential for off-site operation of railroads, akin to Rio Tinto’s fully autonomous trains in the Australian outback.<sup>34</sup>

## CONCLUSION

America has built the world’s most prosperous, innovative economy with a number of building blocks. The Commerce Clause and the judgements that enforced federal preeminence over interstate trade in goods gave us a national single market in long-distance transportation. Powerful incentives for states to take from the whole to make some of their own better have been reined in by Congress’ periodic reassertion that it, not the states, decides when enough is enough. Congress created the FRA as its agent for managing this process, tasking the regulator with the mandate to keep goods flowing efficiently while making the nation’s rail network ever safer.

With the staffing NPRM, FRA did its job. It proposed a rule, considered all the public feedback from thousands of comments and acted on the available evidence. With respect to other rules, it has found points where technology has improved, studied them both in a laboratory setting and on live track through pilot programs and waivers and then has begun the process of regulatory updates that will lower the burden of government on railroads and their consumers. Transportation technology is evolving quickly. Both Congress and the FRA are watching intently and we can only hope that when they step in next, it will be in the name of commerce, rather than economic protection.

## ABOUT THE AUTHOR

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## ENDNOTES

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