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**PUBLIC
INTEREST
COMMENT**

PUBLIC INTEREST COMMENT ON TRAIN CREW STAFFING RULE

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Train Crew Staffing

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INTRODUCTION

The Regulatory Studies Program of the Mercatus Center at George Mason University is dedicated to advancing knowledge about the impact of regulation on society. As part of its mission, the program conducts careful and independent analyses that employ contemporary economic scholarship to assess regulations and their effects on the economic opportunities and the social well-being available to all members of American society.

In this comment, I primarily address the efficacy of this proposed rule from an economic point of view. The primary concern is countervailing risk. The Federal Railroad Administration (FRA), by requiring a greater expenditure on additional personnel required by this proposal, may induce some railroads to reallocate scarce resources away from those activities that are historically associated with improved safety—such as track and equipment maintenance or other infrastructure investments. Because investment, and the safety it can create, stems from financial performance, the costs of any new safety rule necessarily create a trade-off. The additional safety that the new rule creates must be weighed versus the losses in safety caused by deterred investment. Two offsetting effects, in particular, warrant consideration: deterred

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investment in infrastructure, including track and equipment maintenance, and deterred investment in safety-enhancing technology and innovation.

Another matter of major concern is the lack of evidence that the proposal would actually make any operations safer. Even if there were no safety trade-offs from deterred investment, the FRA's basis for this proposal amounts to little more than speculation tied to faulty analysis and delivered with the authoritative voice of a federal agency.

Any credible estimation of the net effect of the proposed rule would need to consider losses to safety caused by an induced diminution of track and equipment maintenance or other safety-enhancing investments. Given the proven record of maintenance and infrastructure investments on safety rates—reviewed in detail below—this proposed rule may not only be ineffective in reducing accident rates, but it may also actually increase the net accident rate. It is primarily because of these unintended consequences that I recommend that the FRA withdraw its proposed rule.

1. SUMMARY OF THE PROPOSED RULE

The FRA proposes, among other things, to require a minimum size of train crew staffs. According to the notice of proposed rulemaking (NPRM), the FRA is “concerned that as railroads implement positive train control (PTC) and other technologies, they may expand use of less than two-person crews on operations without considering safety risks or implementing risk mitigating actions that FRA believes are necessary.”¹ The proposal would require all railroad operations to have a minimum crew of two people unless the operation was granted a specific exception from the FRA.

2. COUNTERVAILING RISKS AND THE DETERMINANTS OF RAILROAD SAFETY

In its 2011 publication entitled *Regulatory Impact Analysis: A Primer*, the Office of Management and Budget (OMB) explains that OMB *Circular A-4* directs agencies to identify countervailing risks that a proposed rule would create:

A countervailing risk is an adverse economic, health, safety, or environmental consequence that results from a regulatory action and is not already accounted for in the direct cost of the action (e.g., adverse safety impacts from more stringent fuel-economy standards for light trucks). As with other benefits and costs, an effort should be made to quantify and monetize both ancillary benefits and countervailing risks.²

1. Train Crew Staffing, 81 Fed. Reg. 94 (proposed May 16, 2016) (to be codified at 49 C.F.R. pt. 218), 6, available at <http://www.fra.dot.gov/eLib/Details/L17369>.

2. Office of Management and Budget, *Regulatory Impact Analysis: A Primer*, 2011; Office of Management and Budget, *Circular A-4*, 2003.

In the case of the railroad industry, the record of safety improvement over the past three decades indicates a need to consider the forces that have driven that improvement prior to any intervention. Furthermore, the FRA should consider whether this proposed rule would undermine those same factors, producing a countervailing risk that could offset or even overwhelm any positive safety effects that the rule creates.

The most prominent feature of the safety record of the modern railroad industry in the United States is the advent of improved safety that began around the time of the Staggers Act of 1980. The Staggers Act removed various economic restrictions placed on railroads by the Interstate Commerce Commission over the preceding decades. Prior to this regulatory reform, economic regulations diminished the financial incentives of railroads to invest in those activities that increase safety. As a recent study notes:

Under normal market circumstances, railroads have relatively strong financial incentives to operate safely. Railroad accidents harm railroads' own property, employees, shippers' goods, shipper-owned railcars, and third parties. Firms have a direct incentive to prevent accidents that harm their own property. Railroad employees and labor unions are well-informed about safety hazards and have strong incentives to negotiate contracts that force railroads to internalize the costs that accidents impose on employees (Savage, 1998, pp. 77–90). The Federal Employers Liability Act (FELA) makes railroads financially responsible for injuries to workers and increases workers' ability to recover damages by removing many defenses that railroads had under common law (Squires, 2000, pp. 106–07).³

However, economic regulations created an environment far from “normal market circumstances.” Because these regulations reduced railroads' profitability, investment was depressed, particularly in maintenance.⁴ A portion of railroads in poor financial health engaged in risky bankruptcy behavior—deferring risk-reducing activities, such as track and equipment maintenance, because shareholders could avoid full responsibility for a major accident by declaring bankruptcy.⁵

A primary lesson from the era of economic regulation is that regulations that diminish the financial health of railroads can inadvertently induce greater accident risk. Even when accounting for FRA safety regulations, a recent peer-reviewed study estimated that “approximately 89 % of the reduction in the accident rate from 1978 to 2013 was because of the Staggers Act,” because the act “removed many of the constraints on investment and operations that

3. Jerry Ellig and Patrick A. McLaughlin, “The Regulatory Determinants of Railroad Safety,” *Review of Industrial Organization*, 1–28 (2016).

4. Theodore E. Keeler, *Railroads, Freight, and Public Policy* (Washington, DC: Brookings Institution, 1983); Ian Savage, *The Economics of Railroad Safety* (Boston, MA: Kluwer Academic Publishers, 1998), 23.

5. Vicki M. Bier et al., “Effects of Deregulation on Safety: Implications Drawn from the Aviation, Rail, and United Kingdom Nuclear Power Industries” (Report prepared for the Office of Nuclear Regulatory Research, Nuclear Regulatory Commission, 2001), 4–6; Devra Golbe, “Product Safety in a Regulated Industry: Evidence from Railroads,” *Economic Inquiry* 21 (1983): 39–52; Savage, *The Economics of Railroad Safety*, 111.

undermined safety.”⁶ Any regulations—even safety regulations—that hinder the investments that have driven the remarkable improvements in railroad safety since the Staggers Act could have the perverse effect of increasing the accident rate.

For some railroads, the proposed rule will likely create a financial constraint on those investments that are empirically associated with safety improvements. For example, investment in track is negatively correlated with the track-related accident rate, although it is worth noting that this relationship does not hold for investment related to compliance with federal track standards.⁷

Firms’ investment decisions are strongly related to their financial performance, as a large body of economics literature indicates.⁸ The strength of that relationship alone should serve as a warning that this proposed rule could reduce investment in safety-increasing activities, such as track and equipment maintenance. Although the FRA recognizes that compliance with this proposed rule would be costly to railroads, it does not consider that those costs could induce countervailing risks by constraining how railroads may allocate scarce resources. By potentially inducing one or more railroads to reallocate expenditure from track or other infrastructure investments associated with safety improvement to activities required by this proposal, the FRA will create a countervailing risk that may offset the safety outcomes that are the proposed rule’s ostensible purpose.

The development of new technologies, some of which could increase safety, can also be hindered by regulations.⁹ For example, economic regulations of railroads that deterred investment also slowed the development and adoption of new technologies and practices that improve safety, such as car retarders and automated switching.¹⁰ Improved finances can lead to greater investment not only in track and infrastructure but also safety-enhancing new technologies like these—the hindrance of development of these technologies is another countervailing risk that the FRA should consider.

Furthermore, on top of ignoring countervailing risks induced by this proposed rule, the FRA has not presented any substantive evidence that requiring additional crew members would produce safety benefits. Instead, the FRA relies on a deeply flawed analysis and repeated assertions that the proposal will improve safety, as explained in the following section.

6. Ellig and McLaughlin, “The Regulatory Determinants of Railroad Safety.”

7. Scott M. Dennis, “Changes in Railroad Track Accident Rates,” *Transportation Quarterly* 56, no. 4 (2002): 161-74.

8. See, for examples: Alberto Alesina, Silvia Ardagna, Giuseppe Nicoletti, and Fabio Schiantarelli, “Regulation and Investment,” *Journal of the European Economic Association* 3, no. 4 (2005): 791-825; Bentley Coffey, Patrick A. McLaughlin, and Pietro Peretto, “The Cumulative Cost of Regulations” (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, April 2016); John W. Dawson, “Regulation, Investment, and Growth across Countries,” *Cato Journal* 26, no. 3 (2006): 489-509; Birungi Korutaro and Nicholas Biekpe, “Effect of Business Regulation on Investment in Emerging Market Economies,” *Review of Development Finance* 3, no. 1 (2013): 41-50.

9. Coffey, McLaughlin, and Peretto, “The Cumulative Cost of Regulations.”

10. Mark Aldrich, “A Mighty Rough Road: The Deterioration of Work Safety on American Railroads, 1955-75,” *Labor History* 46, no. 3 (2005): 320-321.

3. LACK OF EVIDENCE AND REGULATING BASED UPON “BELIEF”

Executive Order 12866, issued by President Bill Clinton in 1993, formally adopted and ordered executive branch agencies to adhere to several principles of regulation.¹¹ One of these principles concerns the use of information, stating: “Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.”¹² The current administration reaffirmed the principles of Executive Order 12866 in its own Executive Order 13563.¹³ Executive Order 13563 also ordered agencies to “use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible.”¹⁴

The FRA admits several times that it does not have evidence that one-person crews are inherently less safe than those with two or more crew members. For example, the preamble of the NPRM states that the FRA “does not currently collect sufficient data related to the size of a train crew nor do accident reports investigations generally address the size of a crew in order for [the] FRA or any entity to definitively compare one-person operations to multiple person operations.”¹⁵ Immediately contradicting itself, the preamble then states, “However, [the] FRA has studies showing the benefits of a second crewmember and other information detailing the potential safety benefits of multiple-person crews.” No citation to these “studies showing the benefits of a second crewmember” is offered.

The accompanying regulatory impact analysis (RIA) also claims that “studies show that one-person train operations can increase risks by overloading the sole crew member with tasks.”¹⁶ However, this claim cites only one study: an FRA-sponsored report entitled, “Technology Implications of a Cognitive Task Analysis for Locomotive Engineers” by Emilie Roth and Jordan Multer. That study documents the results of a cognitive task analysis that was performed to examine the cognitive and collaborative demands and activities of locomotive engineers. While the study contains interesting implications regarding the adoption of new train control technologies, such as the positive train control systems recently required by FRA regulations,

11. Exec. Order No. 12866, 58 Fed. Reg. 190 (1993), section 1, subsection (b).

12. *Ibid.*, section 1, subsection (b)(7).

13. Executive Order No. 13563 states, “This order is supplemental to and reaffirms the principles, structures, and definitions governing contemporary regulatory review that were established in Executive Order 12866 of September 30, 1993.” Exec. Order No. 13563, 76 Fed. Reg. 14 (2011), section 1, subsection (b).

14. Exec. Order No. 13563, section 1, subsection (c).

15. Train Crew Staffing, 7. Other instances of this admission occur throughout the NPRM. To name just a couple, see Train Crew Staffing, 7: “Further, even if FRA does not have data to prove a direct correlation between higher rates of safety and multiple person crews, it is true that railroads have achieved a continually improving safety record during a period in which the industry largely employed two-person crews”; and Train Crew Staffing, 14: “While FRA does not have information that suggests that there have been any previous accidents involving one-person crew operations that could have been avoided by adding a second crewmember, this rule would break even with its estimated costs if it prevents one fatal injury or high-consequence accident in the first 10 years of the rule (and no additional safety costs result from the presence of additional crew).”

16. Department of Transportation, Federal Railroad Commission, “Train Crew Staffing,” Regulatory Impact Analysis, February 18, 2016, 1.

it does not, by any means, “show that one-person train operations can increase risks” as the RIA claims. In fact, the study relies on interviews with locomotive engineers, conductors, and trainers, combined with direct observations. The interviewed employees work in, and the direct observations occurred in, two environments: passenger railroad operations and freight railroad operations. However, the specific operations that were investigated are drastically different from those where one-person crew operations may exist. Regarding passenger operations, the study notes, “In Amtrak passenger train operations, a crew consists of a minimum of three employees: a locomotive engineer, a conductor, and an assistant conductor. . . . Generally, two individuals, two locomotive engineers or an engineer and a conductor, are required in the cab.”¹⁷ Similarly, for freight operations, the study writes, “two individuals work in the cab; a locomotive engineer who is responsible for running the train, and a conductor who is in charge of the train.”¹⁸ While one-person crew operations certainly exist, they were not the subject of this study. In fact, the study itself states, “Additional analyses would be needed to explicitly address the one-person operation case.”¹⁹

To the degree that the FRA does rely on empirical analysis to motivate its “belief,” the analysis is deeply flawed. In Section 6.3 of the RIA, the FRA reports some details of its sole attempt at a statistical analysis. This analysis entails the performance of paired t-tests to “determine if known one-person crew short-line railroads had a higher accident rate compared with the overall similar industry.” Non-Class I railroads are grouped into four categories: those with more than 400,000 labor hours, those with less than 400,000 labor hours, all non-Class I railroads, and non-Class I railroads identified by an FRA survey to engage in one-person operations. The t-tests purport to compare the difference in accident rates across the groups, concluding that the “results provide strong evidence that shortline railroads with one-person operations have a statistically overall higher accident/incident rate than similar sized railroads.” The RIA states that the FRA’s tests were performed “under the assumption that groups are not independent as they are all shortlines and share ‘common characteristics’ but are *assumed to differ in only one condition (one-person crews)*” [emphasis added].

This approach is fatally flawed. First, the assumption that the different groups differ in only one condition—the usage of one-person crews—implies that many other important measurable factors that affect accident rates are identical across the groups. Simple examples of other important factors are the experience of the crews; expenditure on track maintenance; expenditure on equipment maintenance; and weather and geographic conditions. These factors differ tremendously across railroads and across these groups. By failing to recognize and control for this, the FRA’s t-test will attribute differences caused by other factors to the only difference it assumed to exist between the groups—one-person operations. This approach is exacerbated by the failure to consider whether outliers are driving the results. If, for example, a single railroad that engages in one-person operations is largely responsible for the difference

17. Emilie Roth and Jordan Multer, “Technology Implications of a Cognitive Task Analysis for Locomotive Engineers,” Federal Railroad Administration, 2009, 13.

18. *Ibid.*, 13.

19. *Ibid.*, 5.

in means across the groups, and that same railroad has a higher accident rate because of poor track maintenance, then the FRA’s “statistical analysis” would not only incorrectly attribute the higher accident rate to one-person operations rather than track maintenance, but it would do so for all railroads in the one-person operations group.

In some ways, the FRA is refreshingly forthright about its basis for action being its “belief” that the proposed rule would improve safety despite the lack of evidence. The NPRM and RIA indicated repeatedly that the FRA’s basis for proposing this rule is its “belief” that additional crew members will increase safety. Both the NPRM and the accompanying RIA frequently invoke the FRA’s beliefs as the basis for a decision. The phrase “FRA believes” occurs 40 times in the NPRM’s preamble. The RIA uses the phrase, “FRA believes,” or “FRA further believes” in 27 different instances. Regulating based on a belief, rather than evidence, not only risks adverse consequences, but it also violates several Executive Orders, OMB guidelines, and regulatory best practices.

4. CONCLUDING REMARKS AND RECOMMENDATIONS

When the likely safety benefits are empirically demonstrable and the ensuing consequences on investment are relatively muted, the net effect of a new rule could increase safety. However, in the case of this proposed rule, the FRA has given no consideration to some important countervailing risks that the proposed rule would generate: potential effects on investment and the degree to which those effects on investment would impact safety. This shortcoming not only indicates that the FRA is either unaware of or unconcerned with the actual net effect of this rule on safety, but it also demonstrates a substantial deviation from the directions of OMB regarding the assessment of benefits and costs.²⁰

Furthermore, the proposal relies primarily on a fatally flawed statistical analysis as the basis for its proposal. The FRA buttresses its case by repeatedly asserting its belief that the proposal will improve safety and that other factors and objections are irrelevant. Good intentions and fervent belief do not create positive results. On the other hand, poorly considered regulations—such as this proposed rule—can create negative outcomes.

20. OMB, *Circular A-4*; OMB, *Regulatory Impact Analysis: A Primer*.