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**BEFORE THE
SURFACE TRANSPORTATION BOARD**

HEARING ON REVENUE ADEQUACY

Docket No. EP 761

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

WRITTEN TESTIMONY OF NORFOLK SOUTHERN RAILWAY COMPANY

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Dated: November 26, 2019

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Norfolk Southern Railway Company (“Norfolk Southern”) joins the comments of the Association of American Railroads (“AAR”) in response to the September 12, 2019 Notice of Hearing in this proceeding. Norfolk Southern further submits the attached Verified Statements from the two individuals speaking on behalf of Norfolk Southern at the upcoming hearing.

First, Professor David Sappington of the University of Florida explains why stringent earnings regulation motivated by revenue adequacy considerations would increase railroad operating costs, raise regulatory costs, and stifle innovation in the railroad industry, to the detriment of shippers and those who purchase commodities shipped by rail.

Second, Mr. John Friedmann, Norfolk Southern’s Vice President Network Planning and Optimization, explains why the Surface Transportation Board (the “STB”) should not remove the Bottleneck protections for revenue adequate carriers, as doing so would reduce investment in the rail network and would degrade railroad operations for all customers. Due to the inclusion of information within an Exhibit to Mr. Friedmann’s Verified Statement that Norfolk Southern previously designated as “Highly Confidential” in Ex Parte 711 (Sub-No. 1), Norfolk Southern is

filing both Public and Highly Confidential versions of Mr. Friedmann's Verified Statement and filing a Motion for Protective Order simultaneously herewith.

For the reasons set forth herein, in the comments of the AAR, and in the comments of Norfolk Southern previously filed in Ex Parte 722, which are incorporated by reference herein, Norfolk Southern respectfully asks the STB to abandon the notion of an independent revenue adequacy constraint.

Respectfully Submitted,



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**BEFORE THE
SURFACE TRANSPORTATION BOARD
Docket No. EP 761 et al.**

RAILROAD REVENUE ADEQUACY

**VERIFIED STATEMENT
OF
PROFESSOR DAVID SAPPINGTON**

November 26, 2019

Regulatory Policy Design in the U.S. Railroad Industry

by Professor David Sappington

I. Background Information

My name is David Sappington. I am an eminent scholar in the Department of Economics at the University of Florida, and the Director of the University's Public Policy Research Center.

Since earning my Ph.D. in economics from Princeton University in 1980, I have served on the faculties of the University of Michigan and the University of Pennsylvania and on the technical staff of Bell Communications Research. I have also served as the Chief Economist for the Federal Communications Commission and as the President of the Industrial Organization Society. I presently hold positions on the editorial boards of six major journals, including the *Journal of Regulatory Economics*, the *Rand Journal of Economics*, the *Review of Industrial Organization*, and the *Journal of Economics and Management Strategy*.

My research focuses on the optimal design of incentive structures, with particular emphasis on the design and implementation of regulatory policy. I have analyzed the strengths and weaknesses of a variety of regulatory policies in different industries and in different countries. I have published more than one hundred and fifty articles in leading journals in the profession and have coauthored a book on *Designing Incentive Regulation for the Telecommunications Industry*. My curriculum vitae appears as an attachment to this report.

II. Purpose and Outline of this Report

The Surface Transportation Board ("the Board") has announced that it "will hold a public hearing ... on revenue adequacy issues raised in the report issued by the Board's Rate Reform Task Force" (Surface Transportation Board, 2019). I have been asked by Norfolk Southern Railway Company ("Norfolk Southern") to assess the appropriate role of revenue adequacy considerations in the design of regulatory policy in the U.S. freight railroad industry. This report summarizes my assessment.

Section III of this report offers some perspective for my assessment by reviewing recent trends in regulatory policy in other industries. Section IV explains the rationale for these trends. Section V explores the appropriate design of regulatory policy in the U.S. railroad industry. Section VI provides concluding observations.

For clarity, I summarize my primary conclusions as follows:

1. Regulation to protect shippers that lack effective competition in the U.S. railroad industry should be designed to replicate the disciplining forces of competition.
2. Stringent earnings regulation motivated by revenue adequacy considerations would fail to replicate the disciplining forces of competition.
3. Such regulation is likely to increase operating costs, raise regulatory costs, and stifle innovation in the U.S. railroad industry, to the detriment of shippers and those who purchase commodities shipped by rail.
4. Such regulation would thereby threaten to seriously undermine recent progress in the U.S. railroad industry.

III. Regulators Have Been Moving Away from Stringent Profit Regulation

Every industry has its own idiosyncrasies, and no single regulatory policy is ideal in all industries. Nevertheless, to assess the design of appropriate policy in the U.S. freight railroad industry, it is instructive to briefly review trends in regulatory policy in other regulated industries.

An important trend in many regulated sectors is away from rate of return regulation toward alternative forms of regulation that are commonly referred to as “performance based regulation.”¹ Rate of return regulation (RORR) can be viewed as closely matching the regulated supplier’s revenues to its realized production costs, thereby limiting the supplier’s earnings to what are deemed to be “normal” earnings. In contrast, performance based regulation (PBR) can be viewed as allowing revenues to diverge from realized costs, thereby allowing the regulated supplier to secure extra-normal earnings if it can, for example, achieve exceptional reductions in operating costs.

Prior to 1985, U.S. regulators in all fifty states employed RORR to regulate the intra-state activities of telecommunications suppliers.² State regulators began experimenting with PBR in 1986.³ By 1995, only 18 states were still employing RORR for this purpose. This number shrank to 7 by the turn of the century (Sappington, 2002, p. 237). As of 2007, only 3 states still employed RORR in their telecommunications sectors (Sappington and Weisman, 2010, 2016a).

The U.S. electricity sector has also experienced movement away from RORR. Prior to 1980, U.S. state regulators employed RORR almost exclusively to regulate the intra-state

¹ Alternatives to rate of return regulation are also commonly referred to as “incentive regulation.”

² The Federal Communications Commission (FCC) also employed rate of return regulation to regulate the interstate earnings of AT&T.

³ The FCC implemented PBR to regulate AT&T’s interstate operations in 1989 (Sappington and Weisman, 1996, pp. 82-83). (All references in this report are further identified and compiled in Attachment A hereto.)

operations of electricity suppliers. By 2001, at least 16 states were employing PBR to regulate these operations (Sappington et al., 2001). Although broad-based PBR plans are not as ubiquitous in the electricity sector as in the telecommunications sector,⁴ alternatives to RORR are common in today's electricity sector.⁵

PBR has also been displacing RORR in other countries and in other sectors.⁶ To illustrate, as early as 1994, PBR was being employed in the United Kingdom to regulate airports and suppliers of water and natural gas (Armstrong et al., 1994, p. 165).⁷ Joskow (2008, p. 552) reports the widespread use of PBR to regulate “electric, gas, telephone and water utilities in the UK, New Zealand, Australia, and portions of Latin America.” Makhholm et al. (2012) document the use of PBR in the Canadian electricity and natural gas sectors.⁸

IV. The Rationale for Moving Away from Stringent Profit Regulation

The trend away from stringent earnings regulation in many industries reflects an important principle that is relevant in all industries, including the U.S. freight railroad industry. The principle is that all parties – suppliers and customers alike – can gain when the prospect of extra-normal earnings is employed to motivate regulated suppliers to deliver exceptional performance in the marketplace.

Stringent earnings regulation in general, and RORR in particular, reflects the misguided premise that regulators serve consumers well by systematically precluding regulated suppliers from securing anything more than normal earnings. This premise ignores the fact that a policy that limits a supplier to normal earnings – regardless of its performance – provides the supplier with little or no incentive to excel in the marketplace. In particular, stringent earnings regulation

⁴ Broad-based PBR plans permit substantial variation in earnings and do not link the authorized variation to particular performance dimensions, such as specific elements of service quality. Sappington and Weisman (2016a,b) explain why broad-based PBR plans may be more ubiquitous in the telecommunications sector than in the electricity sector.

⁵ Lowry (2007), Joskow (2008), Makhholm et al. (2012), Fox-Penner et al. (2013), and Lowry et al. (2013) describe settings where PBR has been implemented in the electricity sector.

⁶ Sappington (1994, p. 245) observes that “[i]ncentive regulation has replaced rate of return regulation as the norm in many industries.” Similarly, Carson (2010, p. iv) notes that “PBR has replaced traditional rate of return (ROR) regulation for utility rate regulation in many jurisdictions across the world.”

⁷ As Cunha Marques (2010, p. 209) reports, PBR is also employed in the water sector in many countries other than the UK.

⁸ Kirkpatrick et al. (2005) note the extensive use of PBR in the telecommunications and energy sectors of the transition economies of Albania, Algeria, Barbados, Botswana, Brazil, Cameroon, Colombia, Estonia, Gabon, Georgia, Ghana, Guinea Bissau, India, Jamaica, Jordan, Kenya, Lithuania, Malawi, Mexico, Morocco, Nicaragua, Nigeria, Oman, Pakistan, the Philippines, Romania, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Uganda, Uruguay, Venezuela, Zambia, and Zimbabwe.

provides no incentive for the regulated firm to engage in the challenging, costly processes of discovering more efficient means of operation and identifying and fulfilling the needs and desires of consumers.

The more enlightened philosophy underlying PBR is that all parties can gain when regulated suppliers are motivated by the prospect of financial reward to discover innovative ways to operate more efficiently and to serve the best interests of consumers.⁹ Indeed, the prospect of extra-normal earnings is precisely what drives producers in competitive markets to innovate and serve the best interests of consumers.¹⁰

V. The Design of Regulatory Policy in the U.S. Railroad Industry

The recent experience in other regulated industries and the rationale for this experience have important implications for the appropriate design of regulatory policy in the U.S. freight railroad industry.

A. Regulatory policy should replicate the disciplining forces of competition

In an industry where many actual or potential rivals compete to serve customers, no regulation is needed to induce suppliers to serve the best interests of consumers.¹¹ The financial rewards that accompany success in the marketplace motivate suppliers to continually strive to reduce their operating costs, to develop new and improved services, and generally to serve the best interests of consumers (Schumpeter, 1942). In this sense, competition is the ideal regulator of industry activities, and additional regulation should be avoided when industry competition is sufficiently intense.¹² In some industries, though, the massive infrastructure required to supply

⁹ As Weisman and Pfeifenberger (2003, pp. 58-59) observe, “the broad appeal of incentive regulation is precisely that the realized efficiency gains can benefit regulated firms and consumers alike. In other words, because incentive regulation is not a zero-sum game, higher profits and lower prices need not be mutually exclusive.” Similarly, Sappington (1994, p. 269) notes “it is essential to recognize that incentive regulation can provide gains for both consumers and producers in the regulated industry. It is important that gains for regulated producers not be viewed as losses for customers: such a perspective can lead to lost opportunities for all parties.”

¹⁰ As Weisman and Pfeifenberger (2003, pp. 56-57) observe, the “performance incentives fostered by competitive markets derive from the profit motive. The quest for such profits ultimately benefits society as producers strive to supply the goods and services that consumers want at the lowest possible cost.”

¹¹ Viscusi et al. (1992, p. 2) note that “If we existed in a world that functioned in accordance with the perfect competition paradigm, there would be little need for antitrust policies and other regulatory efforts.” Sappington and Weisman (1996, p. 3) observe that regulation “is appropriate only if competition in the industry is insufficient to drive all industry participants to pursue social goals.”

¹² Kahn (2002, p. 53) concludes that the “experience of the airlines, telecommunications and electricity industries over the last 30 years amply documents the superiority of competition over comprehensive regulation.”

high-quality service precludes the profitable operation of a large number of suppliers.¹³ When effective competition is absent, regulation can sometimes play a useful role in substituting for the discipline that competition would otherwise impose on industry suppliers.

In settings where regulation is needed as a substitute for competition, regulatory policy typically should be designed to replicate the disciplining forces of competition. Indeed, “the single most widely accepted rule for the governance of regulated industries is regulate them in such a way as to produce the same results as would be produced by effective competition, if it were feasible” (Kahn, 1970, p. 17). Stated slightly differently, it is an “almost universally accepted ... principle ... that the proper role of regulation is [to] substitute for competitive market forces where those forces are weak or absent” (Baumol and Sidak, 1994, p. 5).¹⁴

B. Revenue adequacy adjustments constitute asymmetric earnings regulation

Revenue adequacy adjustments like the rate increase constraint (RIC) described in the Board’s Rate Reform Task Force Report¹⁵ impose additional constraints on railroads when they are deemed to be securing adequate earnings. The RIC serves to limit any difference between a railroad’s operating income and its authorized return on investment.¹⁶

Regulations of this type constitute *asymmetric earnings* (AE) regulation, which generally fails to replicate the disciplining forces of competition. AE regulation is asymmetric in the sense that it effectively places an upper bound on the earnings a railroad can achieve in serving shippers that lack effective competition without implementing a corresponding lower bound on the railroad’s earnings. The regulation would thereby limit a railroad’s financial gains without stemming its financial losses. In doing so, AE regulation would function much like RORR, except that it would fail to provide the protection against unusually meager earnings that RORR often provides.

¹³ Shippers seldom have a choice among many railroads. However, even when only a single railroad supplies relevant rail services, the railroad may still have to compete against other modes of transportation, including trucks, barges, and pipelines.

¹⁴ Similarly, Weisman’s (2006, p. 7) second principle of regulatory policy design states that “Economic regulation should serve as a surrogate for competition.”

¹⁵ Rate Reform Task Force, *Report to the Surface Transportation Board*, April 25, 2019 (https://www.stb.gov/stb/rail/Rate_Reform_Task_Force_Report.pdf).

¹⁶ Rate Reform Task Force, p. 37.

C. Asymmetric earnings regulation does not replicate the discipline of competition and would increase operating costs in the railroad industry

As regulators in many industries around the world have recognized in abandoning RORR, stringent earnings regulation has the potential to seriously impede industry performance. Stringent AE regulation in the U.S. railroad industry would diminish industry performance to the detriment of all shippers.

Stringent AE regulation would harm shippers in part by encouraging higher operating costs in the railroad industry. When a supplier's potential earnings are restricted, the supplier has limited incentive to enhance its earnings, and so has limited incentive to reduce its operating costs.¹⁷ Consequently, AE regulation would promote higher industry costs and corresponding higher industry prices.¹⁸

AE regulation also can motivate railroads to employ factors of production (e.g., capital and labor) in combinations that fail to minimize production costs. Regulation that limits a supplier's earnings to an authorized return on capital investments can induce the supplier to employ excessive capital in the production process. When the authorized return on capital exceeds the supplier's true cost of capital, the supplier can increase its earnings by employing more than the cost-minimizing level of capital.¹⁹ The resulting higher production costs can lead to higher prices for customers.

An even more severe problem arises when the regulator under-estimates the supplier's true cost of capital. In this event, AE regulation will limit a supplier's ability to attract the capital it requires to maintain its infrastructure and deliver high-quality service to its customers. AE regulation can thereby jeopardize both the financial integrity of the regulated supplier and its ongoing ability to provide high-quality service to its customers.²⁰

¹⁷ Cost reductions generate higher earnings, *ceteris paribus*. Under the "constrained market pricing" principles adopted by the Interstate Commerce Commission (ICC, 1985), the rates a railroad charges to captive shippers are not linked to the railroad's own realized costs. Instead, the rates reflect the costs of an efficient stand-alone railroad. Consequently, in contrast to AE regulation, the Board's current regulatory policy presents railroads with strong incentives to operate efficiently.

¹⁸ Posner (1969), Baumol and Klevorick (1970), Beesley and Littlechild (1989), Braeutigam and Panzar (1989), Brennan (1989), Kaserman and Mayo (1995, p. 478), and Newbery (1999, p. 38) are among the many scholars who observe that earnings regulation can limit incentives for cost containment.

¹⁹ This conclusion is demonstrated formally by Averch and Johnson (1962), Wellisz (1963), and Baumol and Klevorick (1970), among others.

²⁰ RORR also can limit a supplier's ability to attract capital if regulators inappropriately exclude prudent capital investments from the supplier's rate base, and thereby deny the supplier a return on these investments. The prospect of such inappropriate exclusion can undermine RORR's potential strength in attracting capital (Armstrong and Sappington, 2007, p. 1608) and thereby further the case against RORR (Lowry, 2007).

These drawbacks to regulation that limits a supplier's earnings prevail even when the regulation is symmetric, i.e., even when the regulation limits the downside financial risk a supplier faces in addition to limiting its upside earnings potential. Asymmetric regulation compounds these undesirable incentives. Innovation generally entails risk because the ultimate success of a project (e.g., the design and implementation of a new, potentially lower-cost production process) typically cannot be predicted perfectly. In settings where a supplier stands to gain little if a project succeeds but faces the full financial consequences of a failed project, the supplier will be highly reluctant to undertake the project at all. Consequently, AE regulation would lead to particularly limited incentives for innovation in the railroad industry.

D. Asymmetric earnings regulation stifles both product and process innovation

AE regulation would stifle incentives for product innovation, just as it would limit incentives for cost reduction. Suppliers that are not shackled by stringent earnings regulation have strong financial incentive to enhance the quality of existing service and develop new products and services that consumers value highly. A consumer will pay a higher price for a service he values more highly, and higher prices can enhance a supplier's earnings. When its authorized earnings are restricted, though, a supplier has limited incentive to identify, develop, and introduce new products and services, regardless of how highly consumers might value the product innovations.²¹

The propensity for stringent earnings regulation to stifle innovation and limit valued infrastructure investment is widely recognized. The United States Congress, for example, explicitly instructs the Federal Communications Commission and state telecommunications regulators to consider alternatives to stringent earnings regulation in order to “encourage the deployment on a reasonable and timely basis” of the infrastructure required to deliver high-speed Internet service.²²

There is also considerable empirical evidence that stringent earnings regulation inhibits investment and innovation. In the telecommunications industry, Ai and Sappington (2002, p. 135) find that network-modernizing investment (including investment in fiber optic cable and digital switches) “is more pronounced under ... incentive regulation than under rate of return regulation.” Similarly, in reviewing the economic literature on the effects of regulation on investment, Guthrie (2006, p. 928) concludes that “Investment in network “modernization” ... is greater under incentive regulation than rate of return regulation.” Greenstein et al. (1995) report that incentive regulation policies that entail no explicit restrictions on the earnings of regulated suppliers induce

²¹ Brennan (1989) and Sappington and Weisman (1996, p. 5), among others, observe that earnings regulation can limit incentives for product innovation.

²² Section 706 of the Telecommunications Act of 1996 (Pub. L. No. 104-104, 110 Stat. 56 (codified at 47 U.S.C. §§ 151 *et seq.*)) states in part “The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans ... by utilizing ... price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.”

substantially more network-modernizing investment than do regulatory policies that explicitly limit earnings.

Studies of the electricity and natural gas sectors reach corresponding conclusions. To illustrate, Cambini and Rondi (2010, p. 1) report that the “investment rate is higher under incentive regulation than under rate of return regulation” in these sectors in the European Union.²³

E. Asymmetric earnings regulation would require frequent, comprehensive, and inherently arbitrary allocation of each railroad’s overhead costs

AE regulation that limits a railroad’s earnings in serving shippers that lack effective competition also would require ongoing, comprehensive allocation of a railroad’s joint and common costs. The costs that a railroad incurs in serving shippers that lack effective competition must be calculated in order to determine the railroad’s earnings in serving these shippers. Consequently, in order to implement AE regulation, the Board would need to allocate the entirety of each railroad’s overhead costs on an ongoing basis. It would no longer suffice to allocate selective overhead costs only when a shipper that lacks effective competition challenges a proposed rate.

Such comprehensive, ongoing cost allocation would be a monumental undertaking that is far more challenging and burdensome than the occasional allocation of the common costs associated with a small subset of the facilities employed to serve an individual shipper that lacks effective competition. To illustrate, Norfolk Southern’s railroad network spans 20,000 route miles in 22 states and exhibits wide variation in traffic density due in part to the heterogeneity of the many thousands of distinct shippers that Norfolk Southern serves. Any sensible procedure that might be employed to allocate all of the common costs in such a massive network between shippers that lack effective competition and those that do not would be cumbersome, complex, controversial, and costly.

Such a cost allocation procedure also would be inherently arbitrary. As Braeutigam (1980, p. 182) observes, “shared costs cannot be unambiguously identified with individual products, so that any rule selected to associate shared costs with individual services will be arbitrary.”²⁴ The largely arbitrary nature of allocating the joint and common costs of an entire railroad infrastructure would render highly questionable both the corresponding estimate of a railroad’s earnings in serving shippers that lack effective competition and the associated prices these shippers would face.

²³ Cambini and Rondi (2006, p. 20) also report that investment tends to be more pronounced under forms of PBR that place less stringent controls on authorized retail prices.

²⁴ McKie (1970, p. 12) notes that “Cost allocations are arbitrary, as everyone knows.” Rates based on allocated costs unavoidably inherit the arbitrary nature of cost allocation.

Any cost allocation rules that were ultimately adopted also could encourage railroads to implement technologies that do not minimize industry operating costs. To illustrate, if a relatively small proportion of common costs are counted as costs of serving shippers that lack effective competition, then railroads might gain financially by adopting production technologies that entail inefficiently low common costs and inefficiently high service-specific costs of serving shippers that lack effective competition. The resulting relatively high costs of serving these shippers can increase the prices they pay for rail transport.²⁵

F. Regulators recognize the many drawbacks to AE regulation

As is apparent from their observed behavior in moving away from RORR and toward PBR, regulators are well aware of the many drawbacks to stringent earnings regulation. To illustrate, the U.S. Federal Communications Commission (FCC) has observed:

Traditional “cost-plus” rate of return regulation focuses on establishing a reasonable limit on the carriers’ profits. The limitations and drawbacks of such “cost plus” regulation include distorted incentives in capital investment, encouragement of cost shifting when the carrier also participates in more competitive markets, and little incentive to introduce new and innovative services.²⁶

Similarly, the Massachusetts Department of Public Utilities (MDPU) has explained:

[T]he defects of traditional COS/ROR regulation are well known. The “cost-plus” approach under COS/ROR regulation contributes to (1) lack of incentive for cost control, through its inherent bias favoring expenditures which can be passed through to customers; (2) inflexible and less than efficient pricing; (3) persistent cross-subsidies among service classifications; (4) inefficient allocation of resources; (5) poor asset performance; (6) risk-averse management; and (7) disincentives for innovation. COS/ROR regulation is also a costly method of regulation, and is characterized by long lags both in reflecting and controlling actual utility operations and their costs.²⁷

The Alberta Utilities Commission (AUC) has noted:

²⁵ See Brennan (1990). The rules employed to allocate common costs also can provide inappropriate incentives for railroads to unduly expand or contract the services they deliver to non-captive shippers. See Braeutigam and Panzar (1989, 1993), for example.

²⁶ Federal Communications Commission, *Price Cap Performance Review for AT&T*. Notice of Inquiry. CC Docket 92-134, 7 FCC Rcd 5322, 1992, p. 5322.

²⁷ Massachusetts Department of Public Utilities, “Investigation by the Department on its Own Motion into the Theory and Implementation of Incentive Regulation for Electric and Gas Companies under its Jurisdiction.” D.P.U. 94-158, February 24, 1995, p. 8. “COS/ROR regulation” denotes “cost of service/rate of return regulation.”

[R]ate-base rate of return regulation offers few incentives to improve efficiency, and produces incentives for regulated companies to maximize costs and inefficiently allocate resources. In addition, rate-base rate of return regulation is increasingly cumbersome in an environment where some companies offer both regulated and unregulated services ... These conditions complicate the task for regulators who must critically analyze in detail management judgments and decisions that, in competitive markets and under other forms of regulation, are made in response to market signals and economic incentives. The role of the regulator in this environment is limited to second guessing. Traditional rate-base rate of return regulation provides few opportunities to create meaningful positive economic incentives which would benefit both the companies and the customers.²⁸

G. Asymmetric earnings regulation must not harm shippers that already benefit from effective competition

As the AUC observes, earnings regulation is fraught with particular difficulty when, as is the case in the U.S. railroad industry, suppliers offer both regulated and unregulated services. As noted above, the Board only regulates prices charged to shippers that lack effective competition. Much of the transport services railroads supply are delivered to shippers that enjoy the protection of effective competition.²⁹

Any assessment of a railroad's revenue adequacy for the purpose of assessing the reasonableness of rail freight rates charged to shippers that lack effective competition must be restricted to an assessment of the railroads' earnings in serving those shippers. An assessment that considers the railroad's overall earnings, i.e., its earnings that include those from movements over which the STB has no jurisdiction, would be entirely inappropriate and profoundly unwise.

A policy that bases rates for shippers that lack effective competition on a railroad's overall earnings would effectively confiscate the railroad's earnings in serving shippers with effective competition in order to finance rate reductions for certain shippers below the levels that would prevail in a contestable market. Such an over-reaching regulatory policy would export the deleterious consequences of earnings regulation from a sizable, yet limited, sector of the railroad industry (shippers that lack effective competition) to the entire industry. In doing so, the over-reaching policy would limit the incentives of railroads to compete vigorously against one another and against all other suppliers of shipping services. Such diminished competition would deprive

²⁸ Alberta Utilities Commission, "Rate Regulation Initiative: Distribution Performance-Based Regulation," *Decision 2012-237*, Application No. 1606029, Proceeding ID No. 566, September 12, 2012, section 1.2, paragraph 14.

²⁹ Mayo and Sappington (2016, p. 207) estimate that less than 30% of rail freight traffic in the U.S. is subject to potential rate regulation.

shippers of the many benefits of effective competition and thereby impose substantial harm on these shippers.³⁰

If, despite the serious harms it will cause, AE regulation is imposed in the railroad industry, it will be imperative to limit the associated damage to the segment of the railroad industry that lacks effective competition, to the maximum extent possible. If the rate relief granted to shippers that lack effective competition under AE regulation were to reflect a railroad's earnings in serving all shippers, then the regulation would effectively tax, and thereby stifle, the innovation, productivity gains, and cost reductions the railroad achieves in serving all shippers. Such expansion of the unavoidable damages from AE regulation to the effectively competitive segments of the railroad industry would cause significant widespread harm and threaten to reverse the substantial progress the industry has achieved in recent years.³¹ Therefore, if AE regulation is imposed, any associated rate relief granted to shippers that lack effective competition should reflect only a railroad's earnings in serving those shippers.

VI. Conclusion

In summary, stringent earnings regulation entails significant drawbacks that are well known to academicians and regulators alike. The adoption of such regulation would likely seriously impede performance in the U.S freight railroad industry, to the long-term detriment of all shippers and those who purchase shipped commodities.

The U.S. railroad industry has made substantial progress in recent years. The railroads' earnings have improved even as inflation-adjusted rail rates have declined significantly since the passage of the Staggers Act of 1980. The improved earnings have enabled railroads to reinvest more than half a trillion dollars in their operations.³² This investment has produced important innovations of substantial benefit to shippers and the public generally. These innovations include remote control locomotive technology (which enables remote control of a locomotive's operation), modern wayside detectors (that identify rail car defects before structural failure arises), and next-

³⁰ McKie (1970) and Kahn (2002) decry the tendency of regulation to expand beyond the boundaries of the settings in which it serves a useful purpose.

³¹ The Association of American Railroads (2014, p. 1) reports that since the passage of the Staggers Rail Act of 1980 "[inflation-adjusted] average rail rates have fallen 42 percent, train accident rates are down 79 percent, [and] rail traffic volume has nearly doubled." Gallamore and Meyer (2014, pp. 423-4) observe that "under the Staggers Act of 1980, rail industry traffic volumes increased substantially and productivity soared. Shippers benefitted handsomely because railroads cut average revenue per ton-mile (a proxy for rate levels) in half."

³² Association of American Railroads (2014, p. 1).

generation dispatching systems (which help to limit network congestion and delay).³³

Innovations like these, increased industry investment, declining real prices, and improved safety performance all reflect in part a successful regulatory policy in the U.S railroad industry.³⁴ The demonstrated success of the policy cautions against major changes, particularly changes that would introduce the well-known, deleterious consequences of stringent earnings regulation.³⁵

³³ See, for example, U.S. Federal Railroad Administration (2006), Weart (2018), and the Association of American Railroads (2018).

³⁴ Association of American Railroads (2014, p. 1).

³⁵ Mayo and Sappington (2016) caution that the gains that have arisen under “the relatively light-touch approach to regulation that followed the passage of the Staggers Act ... can be quickly reversed by poorly designed regulation that eliminates the railroads’ incentive for exceptional performance.” Macher et al. (2014) observe that “If permitted to drift in the direction of creating additional links between railroads’ general profitability and regulatory stringency, ... the use of revenue adequacy will create the real prospect of “bad” or even outright “ugly” economic consequences.”

Attachment A: References

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Attachment B: Curriculum Vitae

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EDUCATION:

1980	Ph.D.	Economics, Princeton University.
1978	M.A.	Economics, Princeton University.
1976	B.A.	Economics, Haverford College.

PROFESSIONAL EXPERIENCE:

1991 – Present	Eminent Scholar, Department of Economics, University of Florida.
2001 – 2002	Chief Economist, Federal Communications Commission.
1989 – 1990	Matherly Professor of Economics, Department of Economics, University of Florida.
1988 – 1989	District Manager, Economics Research Group, Bell Communications Research.
1988 – 1989	Visiting Lecturer with Title of Full Professor, Department of Economics, Princeton University.
1984 – 1989	Member of Technical Staff, Economics Research Group, Bell Communications Research.
1982 – 1986	Assistant Professor, Department of Economics, University of Pennsylvania.
1980 – 1982	Assistant Professor, Department of Economics and Institute of Public Policy Studies, University of Michigan.

ADDITIONAL RECENT POSITIONS:

1999 – Present	Director, Robert F. Lanzillotti Public Policy Research Center, University of Florida.
2019 – Present	Member of Advisory Committee, Digital Markets Initiative, University of Florida.
1989 – Present	Senior Research Associate, Public Utility Research Center, University of Florida.
2009 – Present	Member of Board of Directors, Industrial Organization Society.
2017 – 2019	Affiliate Eminent Scholar, Bob Graham Center for Public Service, University of Florida.
2008 – 2009	President, Industrial Organization Society.
2006 – 2007	Vice President, Industrial Organization Society.

SERVICE ON EDITORIAL BOARDS:

2017 – Present	<i>The Journal of Economic Perspectives</i>	(Advisory Board)
1997 – Present	<i>The Rand Journal of Economics</i>	(Associate Editor)
1995 – Present	<i>The Journal of Regulatory Economics</i>	(Associate Editor)
1993 – Present	<i>Journal of Economics and Management Strategy</i>	(Co-Editor)
1992 – Present	<i>Information Economics and Policy</i>	(Board of Editors)
2009 – Present	<i>The Review of Industrial Organization</i>	(Board of Editors)
2009 – Present	<i>The Review of Network Economics</i>	(Board of Editors)
1983 – 2012	<i>Economics Letters</i>	(Advisory Editor)
2001 – 2006	<i>Journal of Public Policy and Marketing</i>	(Board of Editors)
1996 – 1999	<i>The American Economic Review</i>	(Board of Editors)
1991 – 1994	<i>The Journal of Industrial Economics</i>	(Associate Editor)
1991 – 1994	<i>The Journal of Regulatory Economics</i>	(Board of Editors)
1988 – 1992	<i>The American Economic Review</i>	(Board of Editors)

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- (i) E. Bailey and J. Pack, *The Political Economy of Privatization and Deregulation*, 1995;
- (ii) D. Parker, *Privatisation and Corporate Performance*, 2001; and
- (iii) S. Martin, *Market Failure*, 2018.

JOURNAL PUBLICATIONS (CONTINUED):

“Efficient Awards and Standards of Proof in Judicial Proceedings,” *The Rand Journal of Economics*, Vol. 18(2), Summer 1987, pp. 308-315 (with D. Rubinfeld).

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“Regulating Without Cost Information: The Incremental Surplus Subsidy Scheme,” *International Economic Review*, Vol. 29(2), May 1988, pp. 297-306 (with D. Sibley).

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“Explaining the Choice Among Regulatory Plans in the U. S. Telecommunications Industry,” *The Journal of Economics and Management Strategy*, Vol. 4(2), Summer 1995, pp. 237-265 (with S. Donald).

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- “Revenue Sharing in Incentive Regulation Plans,” *Information Economics and Policy*, Vol. 8(3), September 1996, pp. 229-248 (with D. Weisman).
- “Competition Among Health Maintenance Organizations,” *The Journal of Economics and Management Strategy*, Vol. 6(1), Spring 1997, pp. 129-150 (with W. Encinosa).
- “Penalizing Success in Dynamic Incentive Contracts: No Good Deed Goes Unpunished?” *The Rand Journal of Economics*, Vol. 28(2), Summer 1997, pp. 346-358 (with T. Lewis).
- “Information Management in Incentive Problems,” *The Journal of Political Economy*, Vol. 105(4), August 1997, pp. 796-821 (with T. Lewis).
- “Choosing Among Regulatory Options in the United States Telecommunications Industry,” *The Journal of Regulatory Economics*, Vol. 12(3), November 1997, pp. 227-243 (with S. Donald).
- “Access Pricing With Unregulated Downstream Competition,” *Information Economics and Policy*, Vol. 11(1), March 1999, pp. 73-100 (with T. Lewis).
- “Summarization with Errors: A Perspective on Empirical Investigations of Agency Relationships,” *Management Accounting Research*, Vol. 10(1), March 1999, pp. 21-37 (with J. Demski).
- “Setting the X Factor in Price Cap Regulation Plans,” *The Journal of Regulatory Economics*, Vol. 16(1), July 1999, pp. 5-25 (with J. Bernstein).
- “Employing Decoupling and Deep Pockets to Mitigate Judgment-Proof Problems,” *The International Review of Law and Economics*, Vol. 19(2), June 1999, pp. 275-293 (with T. Lewis).
- “Using Subjective Risk Adjusting to Prevent Patient Dumping in the Health Care Industry,” *The Journal of Economics and Management Strategy*, Vol. 8(3), Fall 1999, pp. 351-382 (with T. Lewis).
- “ACR Reforms to Promote HMO Participation in Medicare + Choice,” *Health Care Financing Review*, Vol. 21(1), Fall 1999, pp. 19-29 (with W. Encinosa).
- “How to Determine the X in $RPI - X$ Regulation: A User's Guide,” *Telecommunications Policy*, Vol. 24(1), February 2000, pp. 63-68 (with J. Bernstein).
- “Contracting With Wealth-Constrained Agents,” *International Economic Review*, Vol. 41(3), August 2000, pp. 743-767 (with T. Lewis).

JOURNAL PUBLICATIONS (CONTINUED):

- “Motivating Wealth-Constrained Actors,” *The American Economic Review*, Vol. 90(4), September 2000, pp. 944-960 (with T. Lewis).
- “Optimal Contracting With Private Knowledge of Wealth and Ability,” *The Review of Economic Studies*, Vol. 68(1), January 2001, pp. 21-44 (with T. Lewis).
- “How Liable Should a Lender Be? The Case of Judgement Proof Firms and Environmental Risk: Comment,” *The American Economic Review*, Vol. 91(3), June 2001, pp. 724-730 (with T. Lewis).
- “The State of Performance-Based Regulation in the U.S. Electric Utility Industry,” *The Electricity Journal*, Vol. 14(8), October 2001, pp. 71-79 (with G. Basheda, P. Hanser, and J. Pfeifenberger).
- “The Impact of State Incentive Regulation on the U.S. Telecommunications Industry,” *The Journal of Regulatory Economics*, Vol. 22(2), September 2002, pp. 133-159 (with C. Ai).
- “Economic Issues at the Federal Communications Commission,” *The Review of Industrial Organization*, Vol. 21(4), December 2002, pp. 337-356 (with E. Kwerel, J. Levy, R. Pepper, D. Stockdale, and J. Williams).
- “Regulating Horizontal Diversification,” *International Journal of Industrial Organization*, Vol. 21(3), March 2003, pp. 291-315.
- “The Federal Communications Commission’s Competition Policy and Marketing’s Information Technology Revolution,” *Journal of Public Policy & Marketing*, Vol. 22(1), Spring 2003, pp. 26-34 (with D. Stockdale).
- “Incentives for Anticompetitive Behavior by Public Enterprises,” *Review of Industrial Organization*, Vol. 22(3), May 2003, pp. 183-206 (with J.G. Sidak).
- “The Effects of Incentive Regulation on Retail Telephone Service Quality in the United States,” *Review of Network Economics*, Vol. 2(4), December 2003, pp. 355-375.
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- “Competition Policy, Parity Regulation, and Self-Sabotage,” *Info*, Vol. 6(1), February 2004, pp. 52-56 (with D. Weisman).
- “Efficient Manipulation in a Repeated Setting,” *Journal of Accounting Research*, Vol. 42(1), March 2004, pp. 31-49 (with J. Demski and H. Frimor).
- “Toward a Synthesis of Models of Regulatory Policy Design with Limited Information,” *The Journal of Regulatory Economics*, Vol. 26(1), July 2004, pp. 5-21 (with M. Armstrong).

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“Overview of the Special Issue – Marketing’s Information Technology Revolution: Implications for Consumer Welfare and Economic Performance,” *Journal of Public Policy & Marketing*, Vol. 22(1), Spring 2003, p. 3 (with A. Silk).

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“In Memoriam to Michael A. Crew (1942–2016),” *The Journal of Regulatory Economics*, 52(2), October 2017, pp. 105-106 (with M. Spiegel).

HONORS AND AWARDS:

2017 – 2019	Term Professorship Award, University of Florida.
2017	<i>The Energy Journal's</i> Campbell Watkins 2017 Best Paper Award.
2015	Distinguished Member Award Transportation and Public Utilities Group.
2015	Faculty Honoree, Anderson Scholars Program University of Florida.
2011 – 2014	Research Foundation Professorship, University of Florida.
2003	Distinguished Service Award, Public Utility Research Center University of Florida.
2000	Faculty Honoree, Anderson Scholars Program University of Florida.
1998	Professorial Excellence Program Award, University of Florida.
1997 – 2000	Research Foundation Professorship, University of Florida.
1992	Research Achievement Award, University of Florida.
1976	Inducted into the Phi Beta Kappa Society.

REFeree/REVIEWER FOR:

Accounting Review
Addison Wesley, Publishers
American Economic Journals:
 Economic Policy, Microeconomics
American Economic Review
American Law and Economics Review
American Enterprise Institute
Bell Journal of Economics
Berkeley Electronic Press Journal of
 Economic Analysis and Policy
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Econometrica
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Economic Inquiry
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Energy Economics
Energy Journal
Encyclopedia of Law and Economics
European Economic Review
European Journal of Operational Research
Games and Economic Behavior
Harcourt Brace, Publishers
International Economic Review
Information Economics and Policy
International Journal of
 Industrial Organization
International Journal of the Economics
 of Business
International Review of
 Law and Economics
Israel Science Foundation
Johns Hopkins University Press
John Wiley, Publishers
Journal of Accounting Research
Journal of the American Statistical
 Association
Journal of Business
Journal of Competition Law & Economics
Journal of Corporate Finance

Journal of Economic Behavior and
 Organization
Journal of Economic Dynamics and Control
Journal of Economic Literature
Journal of Economic Theory
Journal of Economics and Business
Journal of Economics and Management
 Strategy
Journal of Environmental Economics and
 Management
Journal of Health Economics
Journal of Industrial Economics
Journal of International Economics
Journal of Law and Economics
Journal of Law, Economics and Organization
Journal of Marketing Research
Journal of Policy Analysis and Management
Journal of Political Economy
Journal of Public Economics
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Management Science
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MIT Press
National Science Foundation
Nonlinear Dynamics and Systems Theory
Oxford Economic Papers
Oxford University Press
Princeton University Press
Quarterly Journal of Economics
Quarterly Review of Economics and
 Business
Rand Journal of Economics
Research Grants Council of Hong Kong
Research in Labor Economics
Review of Economic Studies
Review of Economics and Statistics
Review of Industrial Organization
Review of Network Economics
Sloan Foundation
Southern Economic Journal
Telecommunications Policy
Utilities Policy
World Bank Economic Review

SELECTED ADDITIONAL EXPERIENCE:

1997 – Present	Instructor in <i>The International Training Program on Utility Regulation and Strategy</i> , sponsored by The World Bank and the University of Florida's Public Utility Research Center.
2018 – Present	Advisor to Colonial Pipeline Company on The Design of Regulatory Policy for Oil Pipelines.
2019	Advisor and Expert Witness for Norfolk Southern Corporation on The Design of Regulatory Policy in the Railroad Industry.
2018 – 2019	Advisor to DISH Network on Industry Consolidation in the Communications Sector.
2018	Advisor to INCOMPAS on The Design of Competition Policy in the Communications Sector.
2017	Advisor to DISH Network on Competition Policy in Broadband and Media Markets.
2016	Advisor to Norfolk Southern Corporation on The Design of Access Policy in the Railroad Industry.
2016	Advisor to the Alliance of Automobile Manufacturers on The Impact of Safety Recall Legislation in the Automobile Industry.
2015 – 2016	Advisor to Sprint Corporation on The Design of Regulatory Policy for Business Data Services.
2014 – 2015	Advisor and Expert Witness for Norfolk Southern Corporation on The Design of Regulatory Policy in the Railroad Industry.
2014 – 2015	Advisor and Expert Witness for DISH Network on The Design of Competition Policy in Broadband and Media Markets.
2014 – 2015	Advisor to EPCOR Utilities Incorporated on The Design of Performance Based Regulation in the Energy Sector.
2014	Advisor to COFETEL, Mexico's Telecommunications Regulator on Price Cap Regulation in Mexico's Telecommunications Industry.
2013 – 2014	Advisor and Expert Witness for the Alliance of Automobile Manufacturers on Warranty Repair Compensation Policy.

SELECTED ADDITIONAL EXPERIENCE (CONTINUED):

2013	Advisor to AT&T on The Design of Spectrum Auctions.
2013	Advisor to the National Grid Service Company on The Design of Service Quality Standards in the Electricity Sector.
2013	Advisor to Telefonica on The Design of Price Cap Regulation in Peru.
2011	Advisor to Leap Wireless International on Competition Policy in the Wireless Communications Industry.
2011	Advisor to Telstra Corporation, Ltd. on the Design of Access Pricing Policy in Australia's Telecommunications Industry.
2010	Advisor to COFETEL on Competition Policy in Mexico's Communications Industry.
2010	Advisor to the U.S. Federal Communications Commission on Incentive Regulation and Broadband Deployment.
2009	Advisor to the OECD on Competition Policy in Mexico's Communications Industry.
2009	Advisor to Afilias on the Design of Policy to Assign Internet Names and Addresses.
2008 – 2009	Advisor and Expert Witness for AT&T on the Design of Competition Policy in the U.S. Telecommunications Industry.
2008	Member of Advisory Committee for the "Electronic Health Information Exchange Project," sponsored by the National Governors Association.
2008	Advisor to United States Cellular Corporation on the Design of Telecommunications Universal Service Policy.
2007 – 2008	Advisor to United Parcel Service on the Design of Regulatory Policy in the Postal Industry.
2006 – 2007	Advisor to Earthlink, Inc. on the Design of Telecommunications and Internet Competition Policy.
2006 – 2007	Advisor to Telstra Corporation, Ltd. on the Design of Competition Policy in Australia's Telecommunications Industry.

SELECTED ADDITIONAL EXPERIENCE (CONTINUED):

2005 – 2006	Advisor to General Communication, Inc. on the Design of Telecommunications Competition Policy.
2005	Advisor to United Parcel Service on Competition Policy in the U.S. Postal Industry.
2004 – 2005	Advisor to the Antitrust Division of the U.S. Department of Justice on Competition Policy in the Telecommunications Industry.
2004	Advisor to OSIPTEL, Peru's Telecommunications Regulatory Agency, on the Design of Price Cap Regulation.
2003 – 2004	Advisor to SBC, Inc. on the Design of Performance Measurement Systems in the U.S. Telecommunications Industry.
2003	Presented Invited Testimony to the President's Commission on the United States Postal Service.
2003	Advisor to General Communication, Inc. on the Design of Universal Service and Competition Policy.
2001	Advisor to CONATEL, Ecuador's Central Regulatory Body on the Design of Telecommunications Policy.
2000 – 2001	Advisor to Ameren UE on the Design of Incentive Regulation for Electric Utilities.
1999 – 2000	Advisor to the Antitrust Division of the U. S. Department of Justice on a Proposed Merger in the Communications Industry.
1998 – 2000	Consultant and Expert Witness for United Parcel Service on Postal Industry Pricing.
1998 – 2000	Advisor to the World Bank on Telecommunications Privatization in Africa.
1996	Consultant and Expert Witness for TELUS Communications, Inc. on the Design of Price Cap Regulation.
1995	Advisor and Expert Witness for GTE-California on Incentive Regulation and Telecommunications Competition Policy.

SELECTED ADDITIONAL EXPERIENCE (CONTINUED):

- | | |
|-------------|---|
| 1992 – 1994 | Advisor to the Southern Bell Telephone Company on the Design of Incentive Regulation. |
| 1992 | Advisor to the New York State Public Service Commission on Incentive Regulation in the Electric Power Industry. |

VERIFICATION

I, DAVID SAPPINGTON, declare under penalty of perjury, that the foregoing statement is true and correct and that I am qualified and authorized to file this statement.

A handwritten signature in black ink, appearing to read 'David Sappington', with a long horizontal stroke extending to the right.

Executed: November 26, 2019

DAVID SAPPINGTON

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

HEARING ON REVENUE ADEQUACY

Docket No. EP 761

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

VERIFIED STATEMENT OF JOHN H. FRIEDMANN

My name is John H. Friedmann. I currently serve as Vice President Network Planning and Optimization for Norfolk Southern Corporation ("NS"), a role I assumed upon the creation of that position in January, 2019. My department is responsible for continual development and continual optimization of NS's operating plan and includes teams that interface directly with NS's Transportation and Marketing groups. Immediately prior to my current position, I served for approximately a year as Vice President Network Operations and approximately ten years as Vice President Strategic Planning. When leading NS's Strategic Planning department, I focused on tactical and strategic asset acquisitions and dispositions, line rationalizations, and other transactions designed to preserve and improve the efficiency and capacity of NS's network. During my 25 year career with NS, I have held a variety of other planning, operating, commercial, and administrative positions, including Assistant to the Chairman, Assistant Vice President Strategic Planning, Assistant Vice President Short Line Marketing, and Division Superintendent. I hold a Bachelor's of Science in Industrial Management from Carnegie Mellon University and an MBA from the University of Pennsylvania.

Given my leadership roles, I am intimately familiar with NS's decision-making process with respect to both investment and network operations. With this background, I am providing testimony on the recommendation of the Surface Transportation Board ("STB") Rate Reform Task Force ("RRTF") to remove the "Bottleneck protections" for revenue adequate railroads and its potential impacts on NS's network investment and operations.¹ My testimony does not address any potential legal issues created by such a proposal, nor the other topics raised by the STB's hearing notice in this proceeding.

In many ways, the impacts of the RRTF proposal would be similar to those discussed in the commentary submitted concerning the STB's forced switching proposal in *Reciprocal Switching*, Ex Parte 711 (Sub-No. 1) (STB served July 27, 2016) (hereinafter "Ex Parte 711.1"). Each proposal would strip a carrier of its right to the long-haul and permit shippers to demand that traffic instead be switched to a connecting carrier. Accordingly, removing the Bottleneck protections for revenue adequate railroads would fundamentally degrade NS's investment decision-making process. The threat of diversions would increase the risk of making long-term, fixed investments and therefore affect the levels of investment and quality of service throughout NS's network. Additionally, allowing customers to demand new switching events at locations across NS's system will increase the variability of network operations, increase network cost, and degrade service. Re-routing traffic will disrupt network balance, complicate planning processes, and slow the network for all customers. These effects are particularly acute for NS since it operates in the Eastern United States, where there are numerous interchange points and theoretical re-routing possibilities for short-hauls.

¹ For clarity, my understanding of the RRTF's recommendation is addressed in Section I of this statement.

Moreover, based on my experience and in-depth knowledge of NS's investment and network management processes, I believe the RRTF recommendation would actually prove even more disruptive for a revenue adequate carrier than the STB's forced switching proposal in Ex Parte 711.1. First, the RRTF proposal contains no geographical restriction, meaning all regulated traffic of a revenue adequate carrier would be subject to short-haul. Second, the customer would have complete control over the routing of its traffic, meaning traffic could potentially flow to any interchange location on a carrier's network, irrespective of efficiency or service impacts. Finally, the revenue adequacy status of a carrier can shift from year to year, meaning long-term plans must account for additional variability, and therefore more risk.

All of these factors only exacerbate the potential consequences of acting on the RRTF's proposal to remove the Bottleneck protections for revenue adequate railroads. My statement builds upon prior testimony NS submitted concerning the potential for investment and operational impacts in Ex Parte 711.1 and details the unique complications presented by the RRTF recommendation. Should the STB act on the proposal, these consequences will result in less investment, inferior service, and a weaker rail network.

I. RRTF RECOMMENDATION TO REMOVE BOTTLENECK PROTECTIONS

My statement focuses solely on the STB's request for testimony concerning "Bottleneck changes: The RRTF recommended considering suspension of the STB's Bottleneck protections as applied to long-term revenue-adequate carriers."² My understanding from reviewing the RRTF Report to the STB (Apr. 25, 2019) ("RRTF Report") is that the RRTF's recommendation to remove the Bottleneck protections would result in two changes to the current regulatory system for revenue adequate carriers:

² Hearing Notice at 3.

- (1) Permitting shippers to “direct a bottleneck carrier that could provide origin-to-destination rail service to ‘short-haul’ itself by routing traffic over the lines of the non-bottleneck carrier if it obtained a rail contract under 49 U.S.C. 10709 for the non-bottleneck segment;”³ and
- (2) Permitting shippers to “separately challenge the reasonableness of the local (bottleneck) rate.”⁴

The RRTF further assumed in making its recommendation that the statutory language of 49 U.S.C. § 10705, and other statutory and regulatory provisions, would not otherwise protect “an originating carrier’s routing prerogatives in general and its long haul in particular.”⁵ The RRTF Report did not specify whether a shipper would be forced to make a showing of market dominance or otherwise take any procedural steps, other than obtaining a rail contract from a non-bottleneck carrier, to dictate routing for its shipments. My comments consider the potential impacts of such a regulatory change as recommended by the RRTF.

II. RRTF RECOMMENDATION WOULD HAVE SIMILAR EFFECTS AS THE BOARD’S EX PARTE 711.1 FORCED SWITCHING PROPOSAL

In many ways, removing the Bottleneck protections and permitting shippers to demand that railroads short-haul themselves to connecting carriers looks very similar to the STB’s forced switching proposal in Ex Parte 711.1. In each scenario, a customer could require a railroad to take traffic that the carrier currently can serve in direct service and reroute the traffic to an interchange location with another carrier to handle a portion of the move. As NS explained in its comments in Ex Parte 711.1, such a requirement would have significant “collateral damage . . . including the adverse impact on the financial health of the industry, rail operations and efficiency, and future investments.”⁶ Due to their applicability to the RRTF recommendation,

³ RRTF Report at 40.

⁴ *Id.*

⁵ *Id.* at 40.

⁶ NS Opening Comments, at 3, *Reciprocal Switching*, Ex Parte 711 (Sub-No. 1) (filed Oct. 26, 2016).

and in lieu of repeating many of the points verbatim, I am incorporating my Verified Statement from Ex Parte 711.1, attached as Exhibit A, and the Verified Statement of Jeffrey Sliger, then-Assistant Vice President Transportation Network, attached as Exhibit B. I strongly encourage review of each of these statements in conjunction with my testimony, as they provide both data and real world examples that illustrate and prove the points discussed herein. The key conclusions are as follows:

A. Removal of the Bottleneck Protections Would Reduce NS's Investment

Removing the Bottleneck protections would reduce NS's investment due to the impact on NS's investment decision-making process. My Verified Statement in Ex Parte 711.1 detailed the factors that go into NS's investment decisions. Put simply,

NS identifies which lines need and can economically support capital reinvestment, on the one hand, and which lines should be short-lined, discontinued, or abandoned, on the other hand, because the economics do not support capital reinvestment. Thus, NS's current investment decision-making process minimizes the likelihood of stranded assets.⁷

It is important to note that these decisions are made separately based on the projected return for each line – NS does not make individual investment decisions based on its overall financial condition. When assessing the economics of a line, a number of different variables inject risk into NS's analysis, including the potential for changes in traffic volumes, traffic flows, or overall market conditions. "NS accounts for these risks by requiring a sufficient return on its investment in a line or line segment within a reasonable time."⁸

NS's investment decision-making process necessarily employs a *network* approach. A line segment is assigned 100% of the contribution earned from the traffic originating or terminating on it, irrespective of the length of the move. In my Verified Statement in Ex Parte

⁷ Exhibit A, at 2.

⁸ *Id.*

711.1, I explained the importance that “Anchor Customers” play in this decision-making process.⁹ Returns from these significant customers located at the end of a line justify investment in both the line on which the customer is located and in interior portions of the network over which that traffic moves. Importantly, other customers located along that route can use and benefit from those same infrastructure investments, which generate capacity and drive efficiency for the overall network. For example, the map below highlights (in red) the line extending to Mobile, AL. On this line, the Anchor Customers are near the end of the 250-mile line, and their contribution supports and benefits all customers in southern Alabama.

Mobile, AL Line Supported by Anchor Customers



Accordingly, NS’s recent and historic¹⁰ investments have been made in reliance on its right to its long-haul. Such expenditures include local reinvestment as well expansions to NS’s

⁹ *Id.* at 3-4.

¹⁰ See NS Opening Comments, Verified Statement of David R. Goode, at 21, *Reciprocal Switching*, Ex Parte 711 (Sub-No. 1), (filed Oct. 26, 2016). Goode V.S. at 21 (“The STB’s proposed competitive switching rules directly contradict Norfolk Southern’s core assumption that it would retain the continued ability to provide single-line service. Thus, the STB’s proposed rules ignore Norfolk Southern’s investment-backed reliance on the perpetuation of the existing regulatory regime.”).

network. NS could not, and would not, make capital expenditures on marginal properties being divested by other railroads, such as NS's acquisition of the Delaware & Hudson South line from Canadian Pacific, or on adjoining lines that required significant capacity improvements, such as NS's Meridian Speedway joint venture with Kansas City Southern, without the projected returns generated from long-hauls moving over those lines to/from the rest of NS's network.

As a result, the RRTF recommendation, like the STB's forced switching proposal, would have significant adverse consequences for NS's investment decision-making process and, by extension, for NS's entire network.

First, the increased risk of diversion of traffic under the RRTF would reduce NS's investment. If NS was found to be revenue adequate, the threat of customer's rerouting traffic would create the risk of a substantial loss in the contribution earned from line-haul traffic. This loss in contribution could occur either as a result of: (a) the forced conversion of line-haul traffic to lower revenue short-haul movements to be interchanged with other carriers; or (b) general rate compression. "Accordingly, NS would no longer be able to predict the contribution earned from the traffic on a line with the appropriate level of certainty necessary to support the same levels of infrastructure and other investments on that line."¹¹

As a consequence, "NS would need to modify its investment decision-making process to compensate for this heightened risk, either by discounting the projected contribution based on a calculated risk factor or by accelerating the time period within which capital reinvestment would need to be recovered."¹² Such modification would be a matter of fiduciary duty, as NS's shareholders require a fair return on investment. These changes would take place immediately – NS's decision-making process would change in response to the *risk* of a substantial loss in

¹¹ Exhibit A, at 7.

¹² *Id.*

contribution earned from an Anchor Customer, regardless of whether any particular customer actually sought a short-haul or rate review. Given the heightened risk and therefore higher requirements for investment, fewer lines and capital projects on NS's network would qualify for reinvestment. NS would instead be financially incented to more significantly favor downgrading, abandoning, or spinning off lines. The remaining network would become less resilient, with fewer alternate routes left to provide capacity for growth.

Second, the resulting reduction in investment would fundamentally alter NS's network.

Again, Anchor Customers illustrate the consequences that would flow from the RRTF recommendation. Due to lower levels of projected contributions, an individual Anchor Customer would no longer justify NS's prior levels of investment along the supporting interior portions of the Anchor Customer's route. The corresponding reduction in investment would harm not only the Anchor Customer but also all of the intermediate customers located along the Anchor Customer's route. Furthermore, the contribution earned from the Anchor Customer may no longer justify NS's investment in the portion of the line connecting the Anchor Customer to the rest of NS's network. My Verified Statement in Ex Parte 711.1 explained how this may lead to additional island operations, which would result in both inferior service and higher transportation rates compared to current operations.¹³

In sum, the reduction in investment and constriction of NS's network on account of the RRTF recommendation would result in further traffic diversions to other carriers and other modes, a negative feedback loop that would harm the efficiency and capacity of NS's network and the quality of NS's service product. These impacts would be felt by all customers, regardless of commodity and irrespective of their choice to utilize any new regulatory rights.

¹³ See *id.* at 9-10.

Removal of the Bottleneck protections would skew NS's investment decision-making process in favor of a smaller network and result in an inferior service product and a less reliable and resilient rail system.

B. Increasing Interchange Events Through New Short-Hauls Would Degrade Operations for All Customers

The impacts of the RRTF recommendation to remove the Bottleneck protections would not be constrained to NS's investment decision-making process. As Jeffrey Sliger, NS's Assistant Vice President Transportation Network at the time, identified in his Verified Statement in Ex Parte 711.1, the operational and service impacts of a scheme that would permit customers to reroute traffic previously moved in single-line service to any interchange with connecting carriers would be significant: "Injecting new switching events, let alone new switching events between railroads, at locations across the system will slow the velocity of Norfolk Southern's network, increase the variability of network operations, and degrade service."¹⁴

NS's Service Design Principles. My responsibilities include the functions overseen by Mr. Sliger before his retirement, and I can confirm his conclusions are equally applicable to the RRTF recommendation. NS's network is comprised of 19,500 route miles in 22 states, serving nearly 19,000 unique origin and destination pairs and connecting with all six other Class 1 railroads as well as several hundred regional and short line railroads. NS's planning process extends down to the individual car level – every shipment on NS has a trip plan. For merchandise traffic, a typical shipment consists of the following:

[R]ail shipments are gathered by local trains and brought to the origin serving yard. From there, the car is taken to a classification yard, where it is sorted, or "classified," into a group with other cars headed for the same intermediate or final destination. These groups of cars are referred to as "blocks." Depending on the type of yard, the sorting process involves either sending the cars over a hump or flat switching them (whereby crews use locomotives to push and pull the cars)

¹⁴ Exhibit B, at 1.

onto classification tracks. Each of these classification processes is considered a “handling.” This process is later repeated at intermediate terminals as the shipment progresses across the network (“intermediate handlings”). When the shipment reaches the destination terminal, it is handled for the final time, either for delivery to the consignee via a local train or to a connecting carrier at an interchange point.¹⁵

Our network planning and optimization efforts are aimed at placing the right resources in the right place based on predictions of these traffic flows so that NS can maximize the use of its resources and provide the best possible service quality and reliability to all of our customers. Our customers have different transportation demands and priorities, and those needs can pull in many different directions. Allowing each shipper to optimize how its own traffic flows through the network would, in combination, cripple the overall system. Rather, the ability of the network operator (railroad) to control how traffic moves through the network is a cornerstone of network efficiency.

Perhaps the best example of the benefits of this sort of coordinated judgment is TOP21, NS’s new precision-scheduled railroad (“PSR”) operating plan. Led by my Network Planning and Optimization team, in partnership with our Marketing and Transportation departments, NS began developing the TOP21 plan last year using computer modeling and simulation tools to analyze data and train flows to achieve optimum network fluidity and velocity. The TOP21 plan centers around four key principles: (1) operate as one network, (2) execute a balanced train plan between terminals, (3) serve our customers frequently, and (4) reduce dependence on major terminals.

TOP21 Is Driving NS’s Unprecedented Service Improvements. The key benefits associated with TOP21 – reduced circuitry and improved velocity – directly benefit our customers through faster, more predictable transit times that require fewer assets to move their shipments.

¹⁵ *Id.* at 3.

These improvements allow NS to run fewer trains, use its operating assets more efficiently, and create capacity for growth. So far, the results have been dramatic. Total circuitry for general merchandise and auto traffic is down 27% versus pre-TOP21, and road train miles are down 13%. In the third quarter, NS reduced crew starts and recrews by 11% year-over-year. For the year, average monthly train speed is up 3 miles per hour over 2018 levels, and system terminal dwell has dropped from 23.4 hours in January to 18.1 hours in October. Customers have seen the benefits – NS’s third quarter shipment consistency was an all-time record, and 48% better than the same period in 2018.

Under TOP21, NS is focused even more intently on minimizing the need for intermediate handlings. Our objective of reducing dependence on major terminals is aimed squarely at this goal. As Mr. Sliger’s Verified Statement illustrated with substantial data, “[m]inimizing the number of intermediate handlings is critical to optimizing shipment velocity.”¹⁶ We know that the most efficient, and least costly, handling of a railcar is the one we simply do not have to do. As part of TOP21, we have reduced railcar handlings with forward-looking preplanning at the initial terminal, looking to block as much as of our traffic for the final destination yard as we can. We also continue to prioritize “block swaps,” whereby carriers interchanging traffic each build specified blocks of traffic for the other carrier prior to interchanging that traffic to that carrier. In these ways, cars avoid the extra day or more of transit caused by handling at additional intermediate yards or switching locations.

¹⁶ *Id.* at 10-15. (“Tying these concepts together, an increase in intermediate handlings adds additional work events and more opportunities for failures in plan execution, slowing velocity. These effects are felt by all customers. Lower shipment velocity does not affect only individual cars. Shipments that continue to run via plan are affected because they move on the same trains, run through the same terminals, share the same limited network capacity, and rely on the same resources as those shipments experiencing additional handlings.”).

A good example of this involves Winston-Salem in North Carolina. Previously, all of the carload traffic that came out of Winston-Salem headed south to a hub yard in Linwood, North Carolina. However, after classification, half of those cars would eventually turn right back around and head north. Under TOP21, by doing a little more work pre-blocking cars in Winston-Salem, we are able to send that traffic out of Winston-Salem on a more direct route. This change avoids the trip to Linwood, improving transit times for our customers, and saves 100 miles of circuitry while also freeing up capacity in Linwood to absorb work from other outlying terminals.

RRTF Recommendation Would Inject Complexity Into Operations, Harming Customers.

As Mr. Sliger described in his Verified Statement, any regulatory change that would permit customer to force additional intermediate handling events into the network will have significant consequences for NS's network. "[E]ach new interchange adds volatility into the network. By volatility, I mean uncertain and changing traffic demands to which Norfolk Southern must react through changes in resource deployment and, potentially, the operating plan itself."¹⁷ As a result, I believe removal of the Bottleneck protections would slow NS's network and degrade NS's service for all customers.

These impacts would be generated in several different ways. For re-routed traffic, adding an additional interchange to a shipment that previously moved direct by a single carrier will add not only an additional handling for the interchange, but often additional handlings and circuitry to the shipment's routing. Moreover, the interchange event itself is more complicated than other intermediate handlings, because it requires coordination between two different carriers. Accordingly, this slows velocity, increases cost, and provides more opportunities for plan failure versus single-line service. Using the Winston-Salem example, the resources required to sort a

¹⁷ *Id.* at 18.

specific shipper's traffic for local interchange would detract from our ability to pre-block cars (and provide more direct routes) for the rest of the customer base.

As Mr. Sliger aptly observed, “[a]mplified complexity and added uncertainty are the bane of good service, operating fluidity, and network resilience.”¹⁸ His Verified Statement detailed how adding even feasible new interchange events into an operating plan has cascading effects for other customers' traffic, unwinding efficiencies that permit faster movement by upending the predictable volume flows that permits blocking and block-swapping.¹⁹ Without the benefit of as many blocks, all traffic suffers from increased circuitry, slowing the overall network and increasing cost. The resulting operations undermine the balance of traffic flows, requiring more assets and capacity to move the same amount of freight. Mr. Sliger walked through specific examples of how local impacts of volume shifts quickly cascade to impact other locations and traffic, highlighting NS's actual experiences in Asheville, NC, Toledo, OH, and Dragon, MS.²⁰

Unlike the STB's proposal in Ex Parte 711.1, the RRTF recommendation does not contemplate a restriction on the ability of a customer to demand re-routing of traffic based on the service impacts of such a change or the efficiency of the route. But even if it did, history demonstrates that parties will not be able to foresee or circumvent all of the unintended impacts of forcing traffic to move via less efficient routing. Service crises are sparked by sudden, unplanned shifts in traffic flows that overwhelm a portion of the network. The RRTF recommendation would give shippers the tool to repeatedly inject those types of sudden shocks into the rail system.

¹⁸ *Id.* at 20.

¹⁹ *Id.* at 21-24.

²⁰ *Id.* at 26-28.

NS has reengineered our network, streamlining local service, operating with fewer resources, and optimizing traffic flows as part of one single network. The service improvements and gains that NS and our customers have realized are the direct consequence of the hard work to develop and maximize these efficiencies. However, throwing open our operating plan to constant revision by individual customers, each concerned solely with their individual desires rather than the needs of the overall system, will unwind those advances. Put simply, because of the immense progress NS has made in improving its service product, our operations are even more susceptible to backsliding if regulatory revisions necessitate more circuitous routing, greater equipment and resource needs, and more volatility to handle the same amount of traffic.

III. REMOVING THE BOTTLENECK PROTECTIONS WOULD IN SOME ASPECTS BE EVEN MORE DISRUPTIVE THAN EX PARTE 711.1

While the expected impacts of the RRTF recommendation on NS's investment decision-making process and operations would in many ways mirror the STB's proposal in Ex Parte 711.1, the proposals do have a few key differences that would result in even greater impacts from the removal of the Bottleneck protections.

A. No Geographic Limitation

Unlike the STB's forced switching proposal in Ex Parte 711.1, the RRTF's recommendation to remove the Bottleneck protections would not be limited to shippers within a certain geographic area of an interchange with another carrier. Rather, any shipper could require a revenue adequate railroad to short-haul its traffic to an intermediate interchange point, whether 25 or 250 miles away. This difference means that more traffic, in fact all (regulated) traffic, would potentially be subject to re-routing to a connecting carrier.

Accordingly, from an investment standpoint, the RRTF recommendation introduces even more prospective risk into NS's contribution projections. With greater amounts of traffic subject

to diversion or rate compression, even fewer projects would have sufficient projected returns to justify investment. Again, these impacts would start to accumulate upon implementation of the regulatory change, because NS would be forced to account prospectively for the greater uncertainty of returns from any individual investment.

On the operating side, the lack of a geographic restriction increases the number of potential routing permutations for a customer's traffic. Whereas under Ex Parte 711.1 a carrier would only need to be concerned about the possibility of switching traffic to a nearby interchange, a customer under the RRTF's proposal could force traffic to interchange at any location where it obtained a contract rate from a connecting carrier. The further away the interchange location extended from the origin or destination, the more likely that the re-route would require significant alterations to existing operations and introduction of multiple additional intermediate handlings for the subject traffic. With more potential interchange locations, it is also more likely that traffic from shared origins or destinations would be routed to several different intermediate or interchange points. Such occurrences would further fragment traffic flow densities and prevent efficiencies from blocking, slowing otherwise unrelated traffic.

B. Customer Given Unrestricted Control Over Routing

In contrast to Ex Parte 711.1, the RRTF recommendation contemplates no separate consideration of the operational impacts of a customer's designation. Instead, the RRTF Report only references an undefined qualification that an interchange must be "feasible."²¹ However, even the existence of an active interchange provides no insight into whether that interchange location has sufficient capacity to accommodate the impacted traffic or that rerouting fits within a carrier's operating plan. As a result, if a customer obtains a contract rate from a connecting

²¹ RRTF Report at 13.

carrier, a revenue adequate carrier would not have the ability to refuse or choose alternative routing based on the service impacts to other customers and harms to its overall network. Because each railroad's network is different, a convenient interchange location for one carrier may lack the infrastructure or planned service for another carrier to deliver traffic efficiently. In this way, under the RRTF recommendation network considerations would be sacrificed to an even greater degree to the individual desires of other parties. NS and other Class 1 carriers have created routing protocols designed to maximize the efficiency of the overall rail network by concentrating flows at the most efficient gateways. These protocols would be frustrated by the whims of individual customers.

Recalling the Mobile example, if Anchor Customers were able to short-haul NS by routing their cars off the network at Mobile, the reduced length of haul and network density would diminish investment and degrade service over the entire 250-mile branch supported by those customers.

C. Revenue Adequacy, and Thus Eligibility, Changes Over Time

Removal of the Bottleneck protections will affect NS's investment decision-making process *even if* NS was revenue *inadequate*. That is because a railroad carrier's revenue adequacy status would potentially change over the useful life of the relevant investment, which for railroad infrastructure and equipment ranges from many years to decades. Accordingly, even a revenue inadequate NS could not blindly assume that it would maintain its long-haul on local traffic indefinitely. Indeed, the initial returns from some investments might paradoxically tip a revenue inadequate carrier into revenue adequacy, only to see those revenues diverted before the investment achieved a positive return. Therefore, the risk of any NS investment is raised to some degree even in times of revenue inadequacy, suppressing prospective investment.

Similarly, on the operating side, a carrier would face the possibility of needing to redesign its operating plan every time a new revenue adequacy determination is published. If a carrier achieves revenue adequacy, its operations would suddenly be open to significant disruptions. On the flip side, for revenue adequate carriers, the RRTF recommendation does not address what happens if a customer diverts traffic to a connecting carrier, but the short-haul carrier becomes revenue inadequate during the term of that foreign line contract. In short, the fluidity of a revenue adequacy determination introduces even more instability into a carrier's investments and operations than the STB's proposal under Ex Parte 711.1.

IV. CONCLUSION

The RRTF's recommendation to remove the Bottleneck protections for revenue adequate railroads risks the same types of harm to the rail system as the STB's proposal under Ex Parte 711.1. By allowing customers to divert single-line traffic to connecting carriers, the STB would impose regulatory risk on any NS investments that would skew those calculations in favor of reduced investment and a smaller rail network. That reduction in investment would result in an inferior service product and a less reliable and resilient network for all users of NS's railroad. Importantly, those impacts would be to accrue immediately upon any change in regulation, and the risk would still alter NS's investment decision-making to some degree even at times NS was determined to be revenue inadequate.

From an operational perspective, NS's network planning and optimization efforts, including this year's rollout of TOP21, are premised on designing an efficient and effective operating plan for our entire network. The service gain NS has realized this year are driven in part by our success in minimizing intermediate handlings, eliminating complexity and circuitry, and increasing the velocity of our railroad. If individual shippers are permitted to prioritize their own desires over the optimization of the network, by injecting new interchange events into

formerly single-line service, the RRTF recommendation would slow the network and reduce the service a revenue adequate carrier can provide to all of its customers.

As I warned in my Verified Statement in Ex Parte 711.1, the STB must not ignore the interconnected aspect of freight rail transportation. Purposefully injecting volatility and risk into a railroad's investment and operational decision-making on account of a perception of top-line financial performance would only ensure degradation in the service and value received by all users of that railroad's network. For these reasons, I advise the STB to not act on the RRTF's recommendation concerning removing the Bottleneck protections for revenue adequate railroads.

VERIFICATION

I, John H. Friedmann, verify under penalty of perjury that I serve as Vice President Network Planning and Optimization of Norfolk Southern Corporation, that I have read the foregoing document and know its contents, and that the same is true and correct to the best of my knowledge and belief.

Executed on 11/25/10



John H. Friedmann

EXHIBIT A

**Verified Statement of John H. Friedmann,
STB Ex Parte 711 (Sub-No. 1)**

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

STB Ex Parte No. 711 (Sub-No. 1)

RECIPROCAL SWITCHING

VERIFIED STATEMENT OF JOHN H. FRIEDMANN

My name is John H. Friedmann. I currently serve as Vice President Strategic Planning for Norfolk Southern Corporation (“NS”). I have served in my present position since 2008 and have been employed by NS since 1994. During my 22 years with NS, I have held a variety of planning, operating, commercial, and administrative positions, including Assistant to the Chairman, Assistant Vice President Strategic Planning, Assistant Vice President Short Line Marketing, and Division Superintendent. Since 2006, my responsibilities have focused primarily on tactical and strategic asset acquisitions, line rationalizations, and other transactions designed to preserve and improve the efficiency and capacity of NS’s network. Most recently, I actively participated in the negotiations that resulted in NS’s acquisition of approximately 280 miles of the Delaware and Hudson Railway Company, Inc.’s line as well as in the negotiations that resulted in NS’s transfer of operations of over 300 miles of NS’s line in West Virginia and Ohio (“West Virginia Secondary Line”) to a short-line operating subsidiary of Watco Companies.¹ As such, I am intimately familiar with NS’s decision-making process regarding network investment.

¹ For purposes of this statement, such transfers of operations to a short-line carrier will be referred to as “short-lining” and the applicable variants thereof.

I hold a Bachelor's of Science in Industrial Management from Carnegie Mellon University and an MBA from the University of Pennsylvania.

Based on my extensive and in-depth knowledge of NS's network and its investment decision-making process, I believe that the Surface Transportation Board's ("STB") proposed rules for granting requests for reciprocal switching would fundamentally alter NS's investment decision-making process and adversely affect the levels of investment and quality of service throughout NS's entire network.

I. STB'S PROPOSED RULES FOR RECIPROCAL SWITCHING WOULD FUNDAMENTALLY ALTER NS'S INVESTMENT DECISION-MAKING PROCESS AND ADVERSELY AFFECT ITS NETWORK.

A. NS's Current Investment Decision-Making Process.

NS periodically undertakes a comprehensive tactical and strategic analysis of its network to determine where to invest. At a high level, the calculus of this analysis is relatively simple. NS identifies which lines need and can economically support capital reinvestment, on the one hand, and which lines should be short-lined, discontinued, or abandoned, on the other hand, because the economics do not support capital reinvestment. Thus, NS's current investment decision-making process minimizes the likelihood of stranded assets.

The economics of a line or line segment are never a foregone conclusion, given the risk of changes in traffic volumes, traffic flows, or overall market conditions. However, these risks are manageable. NS accounts for these risks by requiring a sufficient return on its investment in a line or line segment within a reasonable time. As such, NS's current investment decision-making process ensures that NS makes sound, informed investment decisions that promote its

financial health and shareholder value, overall network efficiency and capacity, and a quality service product.²

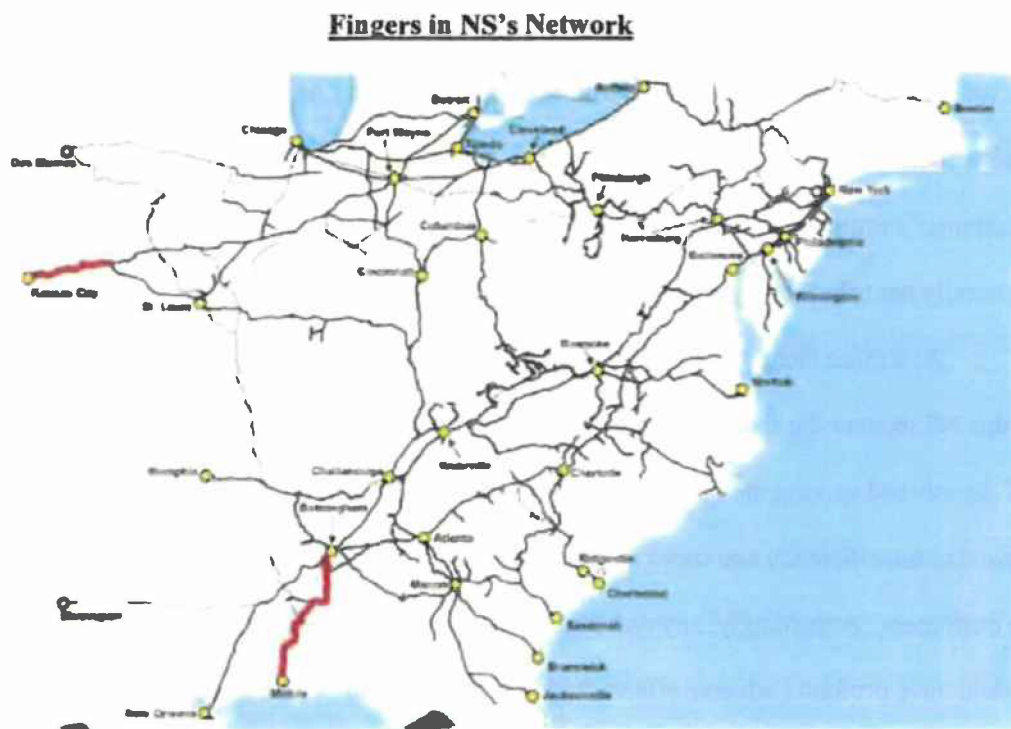
B. Significance of Anchor Customers for NS's Network.

It is important to emphasize that NS's investment decision-making process employs a *network* approach, because a line is assigned 100% of the contribution earned from the traffic originating or terminating on it. Anchor Customers, defined as significant customers concentrated at the end of a line, play a key role in this decision-making process. First, as a local effect, the contribution earned from an Anchor Customer justifies infrastructure and other investments to operate and maintain the line that extends to reach that Anchor Customer. Second, as a broader effect, the contribution earned from an Anchor Customer justifies infrastructure and other investments along the supporting interior portions of the Anchor Customer's route that other customers located along that route can use and benefit from and that generally contribute to overall network efficiency and capacity.

At a more theoretical level, the significant contribution earned from Anchor Customers helps NS recover the fixed and variable costs incurred to run a railroad, specifically, that portion of the railroad serving the Anchor Customer. Such cost recovery is critical to NS's ability to invest in the efficiency and capacity of its network in order to provide a quality service product to customers. Accordingly, any reduction in the contribution earned from Anchor Customers would have profound adverse effects for NS's network and NS's entire customer base, because it would alter the calculus necessary to justify certain infrastructure and other investments.

² See, e.g., Norfolk Southern Corp. 2015 Annual Report on Form 10-K, SECURITIES AND EXCHANGE COMMISSION 7 (filed Feb. 8, 2016) ("We have invested and will continue to invest in various projects and corridor initiatives to expand our rail network to increase capacity and improve transit times, while returning value to shareholders.")

NS's network includes Anchor Customers in most geographic regions. For example, Anchor Customers in the Mobile, AL area provide contribution that helps support portions of a secondary main line in NS's network, the north-south line connecting the Mobile area to the rest of NS's system. As highlighted in red in the map below, the portion of this line extending to the Mobile, AL area is a "finger" in NS's network and depends on on-line traffic for its existence. As another example, Anchor Customers in the Kansas City, KS area provide contribution that helps support portions of another extension of NS's network, the east-west line connecting the Kansas City area to the rest of NS's system, as also highlighted in red in the map below.



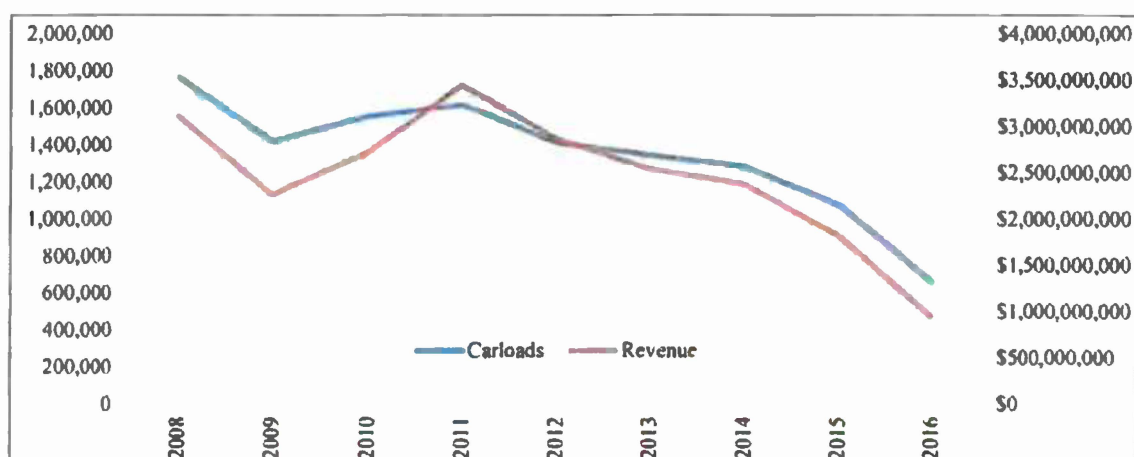
Thus, the efficiency and capacity of NS's network depends, in large part, on the contribution earned from Anchor Customers. The contribution earned from Anchor Customers is critical to NS's ability to prudently invest in maintaining and improving the outer reaches of its network as well as the interior of its network.

1. *Current Environment*

Today, railroads operate under challenging market conditions. I really only need to say one word on this point—coal. But, I will elaborate. At its high water mark in 2008, coal accounted for 24% of total NS traffic and 29% of total NS revenues, with NS transporting approximately 1.8 million carloads of coal equal to approximately \$3.1 billion in revenue.³ Coal-producing mines and coal-consuming plants often served as Anchor Customers in various regions of NS's network. And for many years, the contribution from these coal Anchor Customers justified infrastructure and other investments along these Anchor Customers' routes—such as sidings, double track, signal systems, etc.—that benefited these Anchor Customers, other customers located along their routes, and overall network fluidity.

However, as shown in the graph below, the number of coal carloads transported by NS, and the associated revenues, began to decline after 2008.

NS Coal Carloads and Revenues



This decline was largely a result of global oversupply and a strong U.S. dollar, with respect to export coal, and a result of low natural gas prices, unseasonably warm weather conditions, and

³ Norfolk Southern Corp. 2008 Form 10-K, SECURITIES AND EXCHANGE COMMISSION 7 (filed Feb. 18, 2009)

high inventory stockpiles, with respect to utility coal.⁴ In 2015, coal accounted for only 14% of total NS traffic and 17% of total NS revenues, with NS transporting approximately 1.1 million carloads of coal amounting to approximately \$1.8 billion in revenue.⁵ From 2008 to 2015, the percentage of total NS revenues earned from coal traffic had fallen by over 40%.

Bottom line, NS—like most other railroads—has lost significant contribution over the last seven years due to strong coal market headwinds. Contribution from coal Anchor Customers no longer justifies the same levels of infrastructure and other investments along their routes. For example, NS’s recent decision to cease operations and to short-line its West Virginia Secondary Line directly resulted from the loss of coal contribution. Simply put, as coal Anchor Customers generate relatively less contribution, NS’s investment decision-making process more often concludes that capital reinvestment, along routes serving predominantly coal traffic, is not supported by the economics.

C. Unintended Adverse Consequences of STB’s Proposed Rules.

In order to “ensure the development and continuation of a sound rail transportation system with effective competition among rail carriers and with other modes, to meet the needs of the public,”⁶ the STB must not take any actions that threaten railroads’ ability to recover their fixed and variable costs and to earn sufficient returns on investments. As discussed below, the STB’s proposed rules for reciprocal switching contain this precise threat.

The STB’s proposed rules for reciprocal switching would have unintended adverse consequences for NS’s investment decision-making process and, by extension, for NS’s entire network. As I noted at the outset, NS’s investment decision-making process is predicated on the

⁴ *See, e.g.*, Norfolk Southern Corp. Q4 2015 Earnings Call (Jan. 27, 2016).

⁵ Norfolk Southern Corp. 2015 Form 10-K, SECURITIES AND EXCHANGE COMMISSION 7 (filed Feb. 8, 2016)

⁶ 49 U.S.C. 10101(4).

ability to adequately assess and manage risk. The STB's proposed rules would inject a significant amount of risk into NS's investment decision-making process.

1. Effect on NS's Investment Decision-Making Process

The STB's proposed rules would create the risk of a substantial loss in the contribution earned from line-haul traffic (assuming that the method of access pricing would not adequately compensate a railroad for its lost contribution). This loss in contribution could occur either as a result of: (a) the conversion of line-haul revenues to a lower switching fee; or (b) general rate compression. Accordingly, NS would no longer be able to predict the contribution earned from the traffic on a line with the appropriate level of certainty necessary to support the same levels of infrastructure and other investments on that line. The STB's proposed rules would convert traditionally low-risk investment propositions into high-risk propositions.

NS would need to modify its investment decision-making process to compensate for this heightened risk, either by discounting the projected contribution based on a calculated risk factor or by accelerating the time period within which capital reinvestment would need to be recovered. There are two points to emphasize. First, such modification would be required as a result of the *risk* of a substantial loss in contribution earned from a customer as a result of the STB's proposed rules, regardless of whether the customer actually petitions the STB for forced switching. Second, such modification would be a matter of fiduciary duty, as NS's shareholders require a fair return on investment.

Under these more stringent standards, far fewer lines in NS's network would qualify for reinvestment, not to mention the many types of improvements that NS regularly makes such as the addition of track, sidings, and supporting yards. Thus, the STB's proposed rules would skew NS's investment decision-making process disproportionately in favor of short-lining,

discontinuing, and abandoning lines. To put it bluntly, NS would be required to cede markets and significantly shrink its network.

And, this smaller network would create a negative feedback loop. As NS downsizes its network and concentrates its traffic flows, NS would face a considerable risk of rail-to-rail diversions and rail-to-truck diversions as a result of deteriorating service due to the loss of single-line movements and the increase in handlings by multiple carriers. Such diversions would result in even less contribution assigned to NS's lines, further reducing the economic support for that reduced network.

Thus, the STB's proposed rules for reciprocal switching, an endogenous force, would severely jeopardize the efficiency and capacity of NS's network and the quality of NS's service product. This outcome directly conflicts with the mission of a regulator.

2. *Effect on NS's Entire Network*

Fundamentally altering NS's investment decision-making process is not just a theoretical concern. This change has significant adverse effects for NS's entire network, as demonstrated by considering how NS's altered investment decision-making process would account for the contribution earned from Anchor Customers.

Again, the STB's proposed rules would create the risk of a substantial loss in the contribution earned from Anchor Customers. As a result of any loss or even the potential loss in the contribution earned from an Anchor Customer, NS's altered investment decision-making process would assign significantly less contribution overall to the line extending to the Anchor Customer. This would have two adverse effects on NS's network:

First, the contribution earned from the Anchor Customer would no longer justify NS's prior levels of investment along the supporting interior portions of the Anchor Customer's route.

Thus, NS would need to reduce its investments along the supporting interior portions of the Anchor Customer's route. For example, NS may not have made the significant capacity investments that it put into the Mobile line during the past decade if the contribution from Anchor Customers was in question. This reduction in investment would harm not only the Anchor Customer but also all of the intermediate customers located along the Anchor Customer's route. Reduced investment generally translates into reduced network efficiency and capacity, ultimately resulting in an inferior service product for the Anchor Customer and the intermediate customers on its route.

Second, the contribution earned from the Anchor Customer may no longer justify NS's investment in the portion of the line connecting the Anchor Customer to the rest of NS's network. Thus, NS could be forced to create an island operation to serve the Anchor Customer. An island operation exists where NS serves a customer between an origin and an interchange (or between a destination and an interchange), and those two endpoints of service are otherwise severed from the rest of NS's network. Accordingly, the economic impacts of the STB's proposed rules would result in investment decisions that poke new holes in NS's network, which has been carefully designed to provide extensive single-line service for the benefit of customers.

And if an island operation were created, there would be two economic forces at play. First, to match the reduced contribution earned from the Anchor Customer, NS would need to reduce its level of investment in the island operation, ultimately resulting in an inferior service product for the Anchor Customer. Second, as compared to an integrated operation, the operating costs of the island operation would be significant, due to the need to maintain dedicated equipment and crews to serve the discrete, isolated island. These increased operating costs either would need to be passed on to the Anchor Customer in the form of higher rates or would further

reduce the contribution earned from the Anchor Customer, thereby again resulting in a reduction in the level of investment and quality of service for the Anchor Customer.

Just to be clear, these two adverse network effects apply *regardless* of whether the Anchor Customer actually petitions the STB for forced switching. As explained above, NS's investment decision-making process would be severely distorted by the *mere risk* of a substantial loss in the contribution earned from an Anchor Customer as a result of the STB's proposed rules. There is always some degree of risk from changing market conditions in running a railroad, like in any business. But such risk typically is exogenous, rather than imposed and heightened by the very regulator charged with protecting the national rail transportation system. Unlike NS's rightsizing of its coal network as a rational, tailored response to changing coal market conditions, the STB's proposed rules would alter NS's investment decision-making process for major portions of its network, forcing NS to further downsize its network in order to compensate for the heightened regulatory risk and uncertainty related to the *potential* for changing traffic flows and traffic volumes—without any guiding principles as to the occurrence, location, and extent of these changes. Under such conditions, there is no guarantee that NS's downsized network would be able to serve customers and the public interest.

CONCLUSION

The STB stands on a precipice. As the STB itself has recognized, its proposed rules would place “downward pressure on the rates of those shippers who are eligible” to seek a forced reciprocal switching remedy.⁷ At the same time, the STB is rightly “concerned” about the adverse impact of its proposed rules on those shippers who cannot seek a reciprocal switching

⁷ Notice of Proposed Rulemaking, *Petition for Rulemaking To Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711 (Sub-No. 1), at 14-15 (served July 27, 2016).

remedy.⁸ The STB must look beyond the parochial interests of a small subset of shippers. The STB must not ignore the interconnected network aspect of freight rail transportation. Any short-term pricing relief for a small subset of shippers as a result of the STB's proposed rules would be dwarfed by the long-term harm to all shippers from discouraged investments, inferior service, and a weaker network.

I have personally overseen numerous tactical and strategic line transactions designed to preserve and improve the efficiency and capacity of NS's network. The STB's proposed rules would fundamentally alter NS's investment decision-making process by requiring NS to account for the heightened and substantial regulatory risk of lost contribution from line-haul traffic. This would skew NS's investment decision-making process in favor of a much smaller network. NS's altered investment decision-making process also would result in reduced levels of investment, both at the outer edges of NS's network and along the interior, supporting regions of NS's network. Reduced investment generally translates into an inferior service product and a less reliable and resilient network.

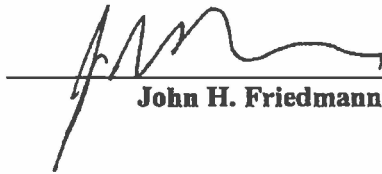
Although I can attest to the eventuality of these adverse network effects, it is impossible to quantify the *magnitude* of these effects, given the interconnectivity of NS's network and the multitude of decisions made on a daily basis within that network. If the STB marches forward with its proposed rules, only time will tell the true harmful effect on the overall level of investment in the network. But it will be substantial.

⁸ *Id.* at 15.

VERIFICATION

I, John H. Friedmann, verify under penalty of perjury that I serve as Vice President Strategic Planning of Norfolk Southern Corporation, that I have read the foregoing document and know its contents, and that the same is true and correct to the best of my knowledge and belief.

Executed on October 19, 2016



John H. Friedmann

EXHIBIT B

Verified Statement of Jeffrey H. Sliger,
STB Ex Parte 711 (Sub-No. 1)

Public Version

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

STB Ex Parte No. 711 (Sub-No. 1)

RECIPROCAL SWITCHING

VERIFIED STATEMENT OF JEFFREY H. SLIGER

My name is Jeffrey H. Sliger. I currently serve as Assistant Vice President Transportation Network for Norfolk Southern Corporation (“Norfolk Southern”). I have served in my present position since March of 2016 and have been employed by Norfolk Southern since 1981. During my 35 years with the company, I have held a variety of positions, including most recently General Manager of Norfolk Southern’s Eastern Region and Division Superintendent in Knoxville, TN; Dearborn, MI; Fort Wayne, IN; and Decatur, IL. My current responsibilities include overseeing Norfolk Southern’s Service Design, Joint Facilities, Operations and Locomotive Control, and Crew Management Center Departments. I attended the University of Tennessee, Knoxville and received my degree in Business Administration and Marketing.

Based on my experience and understanding of Norfolk Southern’s network management and service design processes, I believe that the Surface Transportation Board’s (“STB”) proposal to impose forced switching on certain rail traffic would negatively impact Norfolk Southern’s operations. Injecting new switching events, let alone new switching events between railroads, at locations across the system will slow the velocity of Norfolk Southern’s network, increase the variability of network operations, and degrade service.

Although the STB proposes a case-by-case approach, the effects of granting each individual request will not be confined to those individual locations or to the shippers availing themselves of the regulatory process. Instead, the impacts will accumulate with each successive award, and disruptions at individual locations will cascade to other areas. These accumulative events will be occurring while the landscape is ever changing, adding to the complexity of being able to accurately forecast the effect. The STB will not be able to predict or foresee the consequences of its decisions, nor will the problems that develop be simple to unravel. In short, the STB's proposal is a recipe for a slower and less reliable rail network.

I. THE GOAL OF NETWORK PLANNING AND SERVICE DESIGN IS TO OPTIMIZE SERVICE FOR ALL SHIPPERS USING AVAILABLE RESOURCES.

A. Norfolk Southern's Network and the Principles that Guide Service Design

To understand the negative impacts that necessarily would result from implementation of the STB's proposal, it is important to start with an understanding of the complexity of Norfolk Southern's operations. Norfolk Southern's system is comprised of 20,000 route miles in 22 states, serving nearly 19,000 unique origin and destination pairs and connecting with all six other Class 1 railroads as well as several hundred regional and short line railroads. Within this system, Norfolk Southern essentially runs three different networks: (1) a premium service network, which consists primarily of intermodal and automotive traffic, typically moving between terminals designed to load and unload such traffic; (2) a unit train network, in which dedicated trains carry a single commodity between a single origin and destination; and (3) a general merchandise carload network that handles thousands of shipments every day. All three networks rely upon the same set of limited resources, including the capacity of our rail lines, yards, and other infrastructure, locomotives, railcars, and crews, and other assets necessary to run these operations. These resources are right-sized based on forecasts for customer demand.

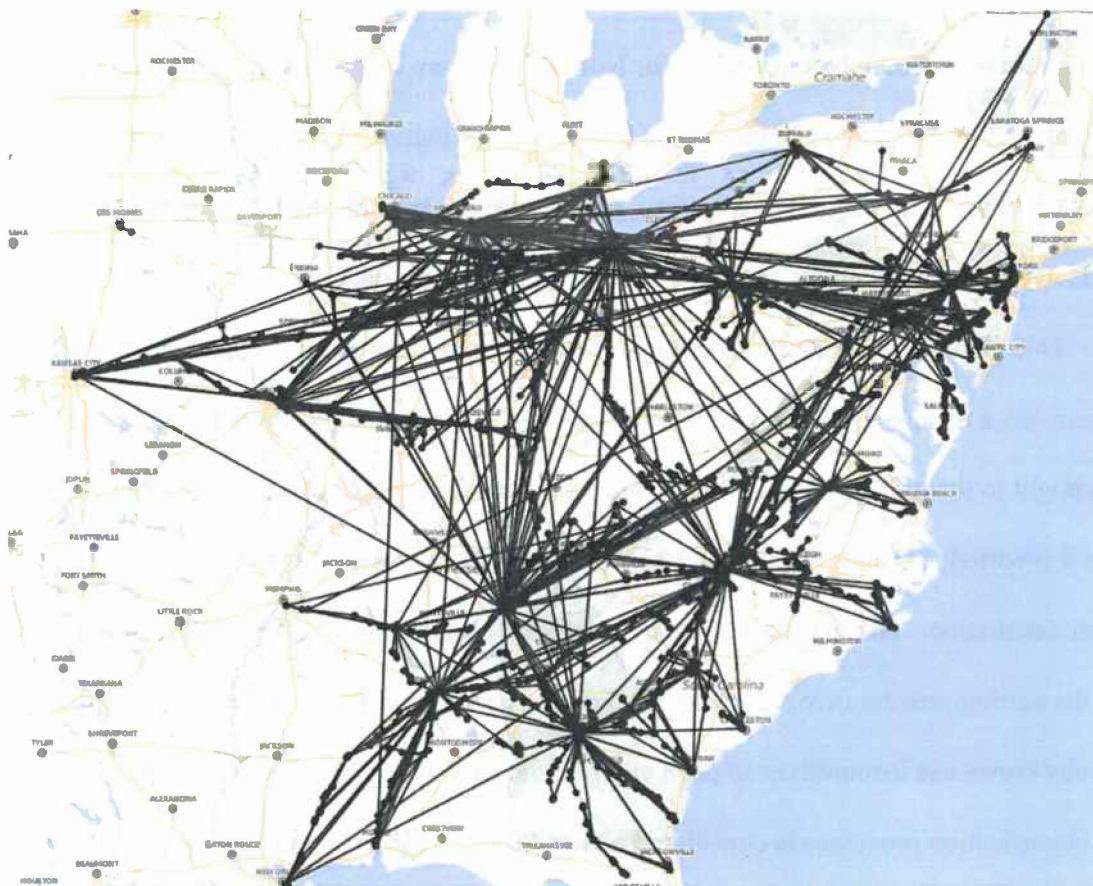
Our planning efforts are aimed at placing the right resources in the right place based on predictions of these traffic flows so that Norfolk Southern can maximize the use of its resources and provide the best possible service quality and reliability to all of our customers. Our service design team is responsible for creating and updating an operating plan to accomplish those twin goals of operating efficiently and meeting customer needs. Often those needs pull in many directions. Our customers have different transportation demands and priorities; much like the airline industry, it would be impossible for Norfolk Southern to provide each individual customer with dedicated service between its desired origin and destination at a time of its choosing and still have rail as a cost competitive option. As a result, it takes coordinated judgment to maximize the capacity and efficiency of the Norfolk Southern network.

This planning process extends down to the individual car level – every car on Norfolk Southern has a trip plan. In our merchandise network, rail shipments are gathered by local trains and brought to the origin serving yard. From there, the car is taken to a classification yard, where it is sorted, or “classified,” into a group with other cars headed for the same intermediate or final destination. These groups of cars are referred to as “blocks.” Depending on the type of yard, the sorting process involves either sending the cars over a hump or flat switching them (whereby crews use locomotives to push and pull the cars) onto classification tracks. Each of these classification processes is considered a “handling.” This process is later repeated at intermediate terminals as the shipment progresses across the network (“intermediate handlings”). When the shipment reaches the destination terminal, it is handled for the final time, either for delivery to the consignee via a local train or to a connecting carrier at an interchange point.¹

¹ This process is explained in more detail in Norfolk Southern’s video “Want to learn more about how a carload moves through our rail network,” available at www.youtube.com/watch?v=oDTnIJsENwc.

The total number of classifications and blocks that Norfolk Southern is capable of making is constrained by the infrastructure and resources at individual facilities, including the employee time it takes to switch and construct such blocks. Consequently, we prioritize those blocks that maximize the efficiency gains to the network.

Figure 1
Norfolk Southern's Merchandise Blocking Network (2016)



Norfolk Southern serves more than 19,000 unique origin-destination pairs, and shipments are grouped into almost 1,300 road blocks and over 4,400 local blocks. **Figure 1** graphically illustrates Norfolk Southern's blocking scheme in its merchandise network. Each individual line represents a group of traffic that is classified and assembled at one endpoint of the line and then moved across the network to the other endpoint. Many blocks originate or terminate at

interchange locations with other carriers, such as Kansas City, the western-most location on our system. Merchandise trains are often made up of multiple blocks of traffic, each headed for a different ultimate destination but sharing a common portion of the journey. Similarly, a single carload may be part of multiple blocks during the course of its journey across the network. For example, a carload moving from an origin near Atlanta, GA, to a destination near Memphis, TN, may be gathered locally in Atlanta and classified into a block moving from Atlanta to Sheffield, AL, where it is then humped and classified into another block moving from Sheffield to Memphis.

Norfolk Southern dedicates significant resources, both in terms of personnel and sophisticated technology, to developing these trip plans. The plans rely in large part on data about historic train movements as well as forecasts for future traffic flows. When operations run smoothly, it is in part a testament to the success of these intense planning efforts.

Several principles guide Norfolk Southern's efforts to design and run as efficient and customer-focused network as possible. These principles include maximizing long-hauls, minimizing car handlings and switches, minimizing the number of times a car must be handled in a yard, maximizing train lengths, consolidating traffic flows, and generating efficiencies in any way possible. All of these principles seek to best utilize our resources, including infrastructure, and reduce the time required for shipments to move through our network. In an asset-reliant service like rail, shipment velocity is a key driver of greater efficiency (and, correspondingly, lower costs). The faster shipments cycle, the higher the utilization of railcars, locomotives, terminals, and other assets. Conversely, as network velocity slows, resource needs increase, and customers inject additional shipments into the system to compensate for the elongation of their

supply chains. Adding more cars and locomotives back into the system further slows shipments – something we know from past experience in the industry.

B. Norfolk Southern's Operating Plan Informs Resource and Investment Decisions.

Norfolk Southern's service design plans drive resource and investment decisions and placement. Getting the proper assets – cars, locomotives, and crews – in the right place takes substantial lead time, even for short-term tactical decisions. Locomotives must be repositioned across a network that runs 24 hours a day, without any down time. Moreover, crews are not fungible. Even if one crew district has extra employees available to cover a shortfall in another nearby district, those employees can be deployed in the other district only if they have been trained and qualified to operate over the new territory. And, in some cases, such reassignments may be prohibited by existing labor agreements.

Norfolk Southern's resource planning groups also use the operating plan to drive longer-term investments, such as equipment acquisitions, leases, and personnel hiring. These decisions must be made many months or even years in advance. For example, it takes at least six to nine months from the decision to add additional conductors in a location to advertise, hire, train, and qualify new employees on that territory. Engineers take even longer, between twelve and fifteen months. Further, new engineers are trained from the existing qualified conductor pool, so we must have sufficient conductors to add significantly to our engineers. Depending on production capacity, new locomotives may need to be ordered several years in advance of actual receipt.

Finally, the operating plan and expected needs of specific customers also inform a variety of investment and strategic decisions, ranging from constructing a new rail siding to expanding or idling a major yard. Of course, construction of additional infrastructure and capacity is even

more time-consuming and costly than adding other resources, as well as more risky because once constructed those assets are fixed and cannot be redeployed to other parts of the system.

Overall, due to the different lead-times required to add resources and infrastructure, Norfolk Southern has limited options to respond in the short-term to increased resource demands. When traffic shifts suddenly and there are not enough resources in the right places, history teaches us that there will be operating problems and service failures. Norfolk Southern's experience with unexpected increases in crude oil and other volumes on our Northern Region in 2014 illustrates this point. Crew and power shortages, especially on our Chicago Line between Chicago, IL, and Cleveland, OH, attributable to those unexpected volumes caused congestion and degraded service. The many measures we implemented in response, including temporary crew relocations, ramping up new hiring, traffic rerouting, etc., eventually brought resources back into balance, but only after a significant period of time.

C. Service Issues in One Area Spread Across the Network.

Such unanticipated shifts in traffic flows also have serious consequences for Norfolk Southern's system as a whole. When traffic exceeds *planned* levels at specific locations, it taxes the crews, locomotives, and infrastructure on which that traffic relies. Those resources, however, are equally vital to serving other customers in the area, leading to congestion. The impacts of constrained capacity and slower velocity radiate outward geographically to other parts of the network. Returning again to 2014, the congestion attributable to increased volumes on our Northern Region affected the velocity and fluidity of Norfolk Southern's entire system.

The interdependence of the rail network by now is well understood. The STB acknowledged in its proposal that:

[a]s has been demonstrated by real-world instances, operational issues in the gateways and terminals can easily spread to other parts of the rail network. The service crises of the late 1990s and the winter of 2013-2014 are stark reminders

that local congestion can turn quickly into regional and national backlogs, affecting shippers of all commodities.

Reciprocal Switching, Ex Parte 711 (Sub-No. 1), at 17 (STB served July 25, 2016) (“Proposal”); see also *Policy Statement on Implementing Intercity Passenger Train On-Time Performance and Preference Provisions of 49 U.S.C. § 24308(c) and (f)*, Ex Parte 728 (STB served Dec. 28, 2015) (“Past rail service crises, such as that during the late 1990s, have demonstrated that congestion at one location can adversely affect the rail network at large.”). Similarly, Amtrak’s Blue Ribbon Panel recently noted that “even relatively small delays” in the Chicago terminal area “can have a ripple effect throughout the U.S. rail network.” Report of the Amtrak Chicago Gateway Blue Ribbon Panel, at 36 (Oct. 2015), available at <https://www.amtrak.com/ccurl/873/180/Chicago-Gateway-Amtrak-Blue-Ribbon-Panel-Final-Report.pdf>.²

For all our planning efforts, Norfolk Southern recognizes that many things that affect our network, such as weather or changes in economic conditions, are beyond our control. As a result, Norfolk Southern’s service design efforts can be best described as our attempt to plan (and deploy) our resources based on anticipated conditions and to minimize, wherever possible, those sources of volatility over which we exert some measure of control. The STB’s proposal attacks that very premise by introducing increased inefficiencies and sources of volatility into the network, in the form of additional handlings and new interchange events.

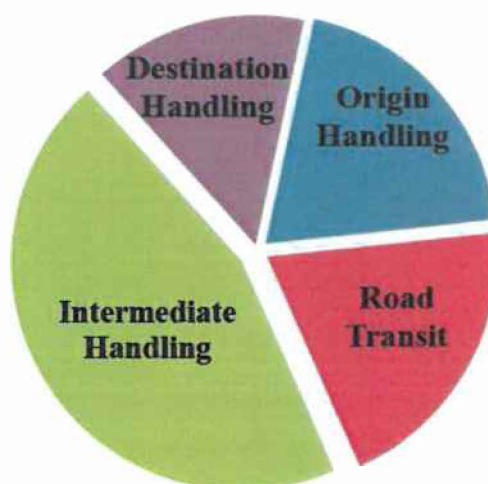
² See also United States Department of Transportation, Office of Inspector General, CR-2008-076, “Root Causes of Amtrak Train Delays,” at 19 (Sept. 8, 2008) (“The rail network operates 24 hours a day, 7 days a week. Delays in one part of the network can set off another type of delay later on in the network, which creates a ‘ripple’ effect. . . . It can take up to 5 days, and sometimes up to 1 month, to restore service to normal operations after an unplanned disruption. Unlike the aviation system, which allows planes to be repositioned overnight, there is no ‘down time’ within which trains can be repositioned.”).

II. INCREASING THE NUMBER OF HANDLINGS NEGATIVELY IMPACTS SHIPMENT VELOCITY AND SERVICE AND WOULD UNRAVEL NORFOLK SOUTHERN'S SERVICE DESIGN EFFORTS.

A. Car Handlings Are Responsible for the Large Majority of Shipment Transit Time.

As referenced above, in our merchandise network a car will be handled at origin, at destination, and (depending on its trip plan) at intermediate terminals as it moves through the network. These handlings account for the majority of the time that a typical shipment spends in transit. Each handling event consumes resources and introduces delays in transit time for the traffic. In fact, as shown below, a typical general merchandise shipment will spend only somewhere around a quarter of its total transit time in road train service.

Figure 2
Percentage of Total Transit Time for Norfolk Southern Merchandise Shipments



As **Figure 2** shows, the time that a car spends, or “dwells,” at yards as a result of intermediate handlings represents the largest component of the transit time. The STB’s proposal would

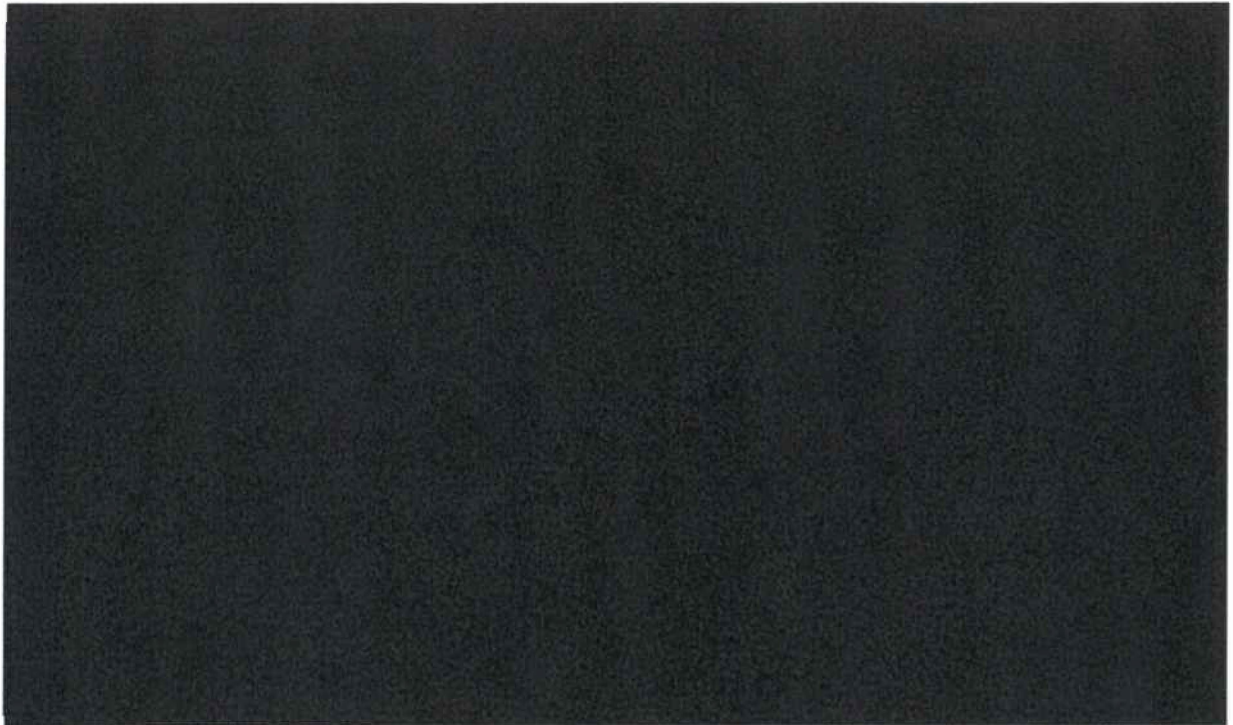
directly and adversely affect this intermediate handling component by increasing the number of car handlings per shipment.

B. Norfolk Southern's Studies Demonstrate the Close Relationship Between Intermediate Handlings, Velocity, and Service Quality.

We know that an increase in car handlings will have a negative impact on Norfolk Southern's entire system because of the correlations between intermediate handlings, shipment velocity, and our service. To quantify velocity, we measure the number of line haul miles a carload moves across the Norfolk Southern system in a day (line haul miles per day, or "LHMpD"). This metric includes train speed during the road haul portion of the movement and all dwell and handling time at intermediate yards, passing sidings, and interchange points, as well as non-handling delays such as crew change, inspection, and fueling activities.

Minimizing the number of intermediate handlings is critical to optimizing shipment velocity. **Figure 3** below illustrates that each additional intermediate handling required per shipment reduces the average velocity of those shipments.

Figure 3
Shipment Velocity and Number of Intermediate Handlings (2014-2016)
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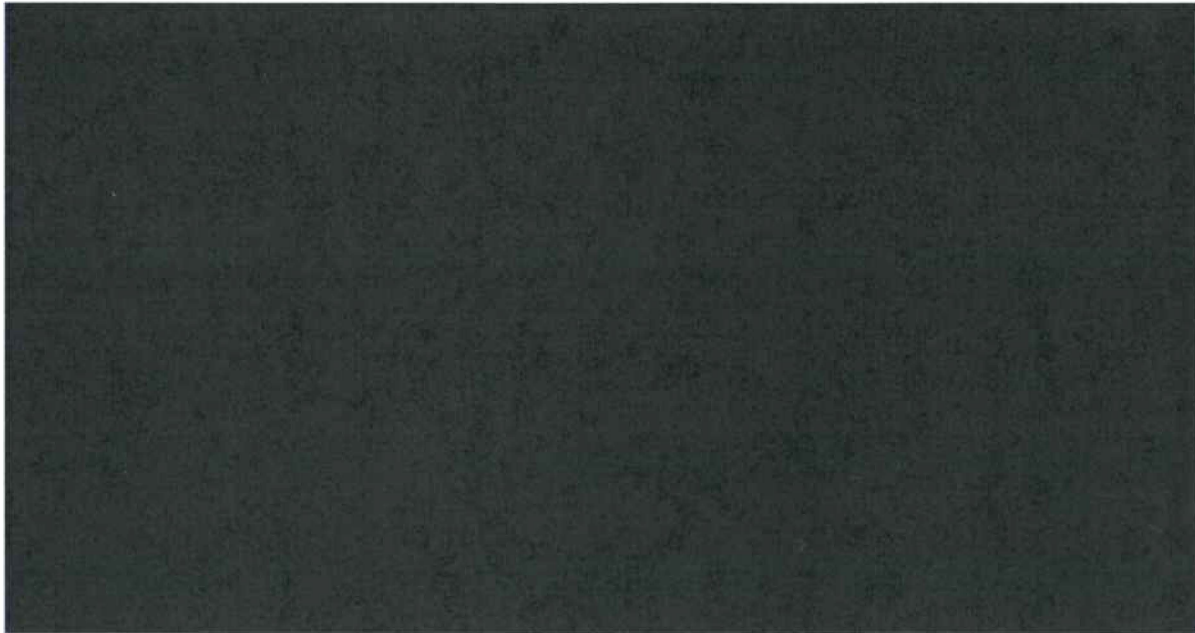
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This relationship makes sense because each handling requires additional time during which the car is not moving towards its destination – the greater that intermediate delay, the less distance the car averages in a given day. And as shown, adding just a single intermediate handling into an otherwise efficient train-load movement (with no intermediate handlings) has a significant impact on shipment velocity and service: injecting that complexity into the movement would reduce the shipment's velocity by almost 50 percent.

Cognizant of this relationship, Norfolk Southern looks for opportunities in its operating plan to minimize the number of intermediate car handlings. As shown below, Norfolk Southern has reduced the average number of intermediate handlings from approximately {{[REDACTED]}} at the beginning of 2015 to approximately {{[REDACTED]}} in mid-2016. Reflecting the inverse relationship

with intermediate handlings, average shipment velocity has increased during that same period from approximately {{█}} LHMpD to almost {{█}} LHMpD.

Figure 4
Line Haul Miles Per Day and Average Intermediate Handlings (2014-2016)
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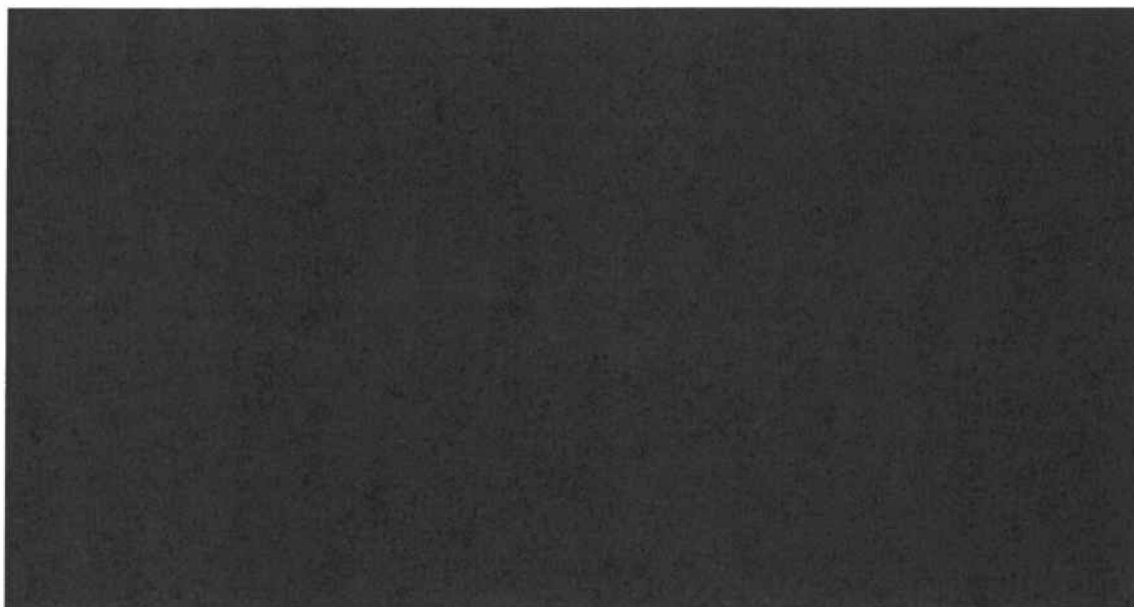


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Indeed, removing handlings from the network speeds up even those movements that require no handling themselves. **Figure 5** again plots the average number of intermediate handlings on Norfolk Southern's network since 2014, this time against the average shipment velocity of just those shipments without any intermediate handlings. Since the beginning of 2015, as intermediate handlings have decreased, average shipment velocity has increased, from approximately {{█}} LHMpD to over {{█}} LHMpD – demonstration that the network effects of intermediate handlings impact even unrelated traffic.

Figure 5
Line Haul Miles Per Day for Shipments with No Intermediate Handlings
and Average Intermediate Handlings (2014-2016)

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Of course, intermediate handlings are not the only factor that influences shipment velocity. Norfolk Southern also seeks to increase LHMPD by reducing the amount of dwell per handling, reducing dwell unrelated to handling, and increasing train speed.

But the demonstrable inverse relationship between intermediate handlings and shipment velocity has substantial consequences for the service that Norfolk Southern provides its customers. Shipment velocity is highly correlated with service performance, as measured by Norfolk Southern's composite service metric.³ **Figure 6** illustrates this correlation since the start of 2014.

³ Norfolk Southern's composite service metric is made up of three components: train performance, connection performance and plan adherence. **Train performance** refers to how well a train runs in relation to its schedule. **Connection performance** refers to how consistently

Figure 6
Composite Service Metric and LHMpD (2014-2016)



Such a correlation is largely intuitive. When trains run on time and yard activities and connections occur as planned, velocity is high. Conversely, when trains are delayed or annulled, or cars are delayed in yards or do not run on planned trains, velocity slows. Tying these concepts together, an increase in intermediate handlings adds additional work events and more opportunities for failures in plan execution, slowing velocity.

These effects are felt by all customers. Lower shipment velocity does not affect only individual cars. Shipments that continue to run via plan are affected because they move on the same trains, run through the same terminals, share the same limited network capacity, and rely on the same resources as those shipments experiencing additional handlings. Further, Norfolk Southern seeks to maximize LHMpD because higher shipment velocity translates into better

shipments make their connections. **Plan adherence** refers to how well a train performs its scheduled activities.

utilization of those resources, in the form of higher equipment turns, fewer locomotive hours, and fewer crew hours. Slower velocity, in turn, consumes greater amounts of all rail resources, including track capacity, and requires shippers to place more cars into the system to make up for longer transit times. When utilization regresses, the entire system runs more slowly, experiences more variation in network operations, and is more vulnerable to localized disruptions.

Overall, higher velocity is vital to Norfolk Southern's ability to attract and retain new business. Norfolk Southern does not have sufficient real estate to expand our infrastructure and existing facilities in most areas. As a result, the capacity of our network rises and falls with velocity. Norfolk Southern must be able to improve velocity in order to achieve and handle growth.

C. Norfolk Southern Seeks Ways to Remove Handlings from the System.

Understanding these effects, Norfolk Southern evaluates ways, both large and small, to eliminate intermediate handlings from the system. A good example of those efforts is Norfolk Southern's recent \$160 million expansion of our major classification yard in Bellevue, Ohio.⁴ Bellevue sits approximately halfway between New York City and Chicago, at the intersection of five Norfolk Southern lines. This major capital project nearly doubled the prior capacity of Bellevue Yard.

One of the biggest benefits of the new capacity at Bellevue Yard is the ability to classify more freight cars and to build more and longer blocks, reducing the number of handling events required for that traffic. Blocking only increases efficiency if a carrier has (1) sufficient volumes headed to the same subsequent handling location to allow it to build a train that can bypass intermediate yards without classifying that traffic, and (2) the yard capacity to construct such

⁴ Bellevue Yard was recently renamed Moorman Yard, but for consistency will be referred to as Bellevue Yard in these comments.

blocks. Bellevue's increased size and throughput allows Norfolk Southern to generate such efficiencies to and from more locations. Additionally, as the number of cars in each existing block increases, fewer blocks are required to fill out each train, meaning those blocks can be grouped to travel longer distances together before they must be split up to go in different directions towards their final destination.

As an example of the reduction in handlings, Norfolk Southern previously had to classify freight headed westward for interchange to Canadian National Railway ("CN") twice in the Chicago area. The traffic first would be classified in Bellevue and put on a train to our yard in Elkhart, IN, then classified again in Elkhart and built into a block to interchange with CN at Kirk Yard. As a result of the expansion project, Norfolk Southern now has the blocking capacity to block this traffic entirely in Bellevue. The train still stops at Elkhart to add additional traffic destined to Kirk Yard, but no additional handling of the interchange traffic from Bellevue is required. That redesigned service cuts out a handling and removes an average of one day from the previous transit time.

Norfolk Southern also looks for ways to make targeted improvements to its operating plan. Norfolk Southern recently began building two new blocks in Fort Wayne, IN, grouping traffic destined for Decatur, IL, and Conway, PA. The Decatur traffic previously moved from Fort Wayne to Elkhart for further classification, while Norfolk Southern sent the Conway traffic from Fort Wayne on to Bellevue for further handling. Because Norfolk Southern has sufficient volumes of traffic in Fort Wayne heading to those locations to build dedicated blocks, Norfolk Southern was able to eliminate a handling and remove circuitous miles from the routing. Norfolk Southern has undertaken a similar effort at Shenandoah, VA, building a new block for Allentown, PA, that allows the traffic to bypass handling in Hagerstown, MD. Norfolk Southern

also recently established Chattanooga, TN, and Bellevue blocks in Roanoke, VA, to bypass classification of cars destined to those locations in Linwood, NC. When Norfolk Southern has sufficient volumes of traffic heading to like destinations to support building these blocks, it can reduce the number of handlings and increase shipment velocity.

D. The STB's Proposal Would Reverse Norfolk Southern's Efforts to Minimize Intermediate Handlings.

The STB's proposal would introduce additional intermediate handling events into the network in the form of new, forced switching with other carriers at some number of unknown locations. Obviously, adding an interchange to a shipment that previously moved direct via a single carrier adds an additional intermediate handling to that service, in the form of that interchange event. But depending on each carrier's operating plan, forced switching may also add new handlings to some traffic beyond just the interchange. Norfolk Southern witness Fred Ehlers explained just such an example in his Verified Statement in Ex Parte 711. For a carload interchanged from CSXT Transportation, Inc. ("CSXT") to Norfolk Southern in Atlanta for delivery in the Atlanta area, Norfolk Southern would need to { [REDACTED]

[REDACTED] } } would be in addition to whatever handling CSXT would undertake to deliver the carload to the interchange location in Atlanta. *See* Norfolk Southern Opening Comments Ex Parte 711 Ehlers V.S. at 15.

Moreover, interchange events often are more complicated than a typical intermediate handling, meaning the effects of the STB's proposal will be even more pronounced. Interchanges require significant coordination between the two railroads involved on issues of timing, location, and infrastructure. Interchange locations vary significantly in their

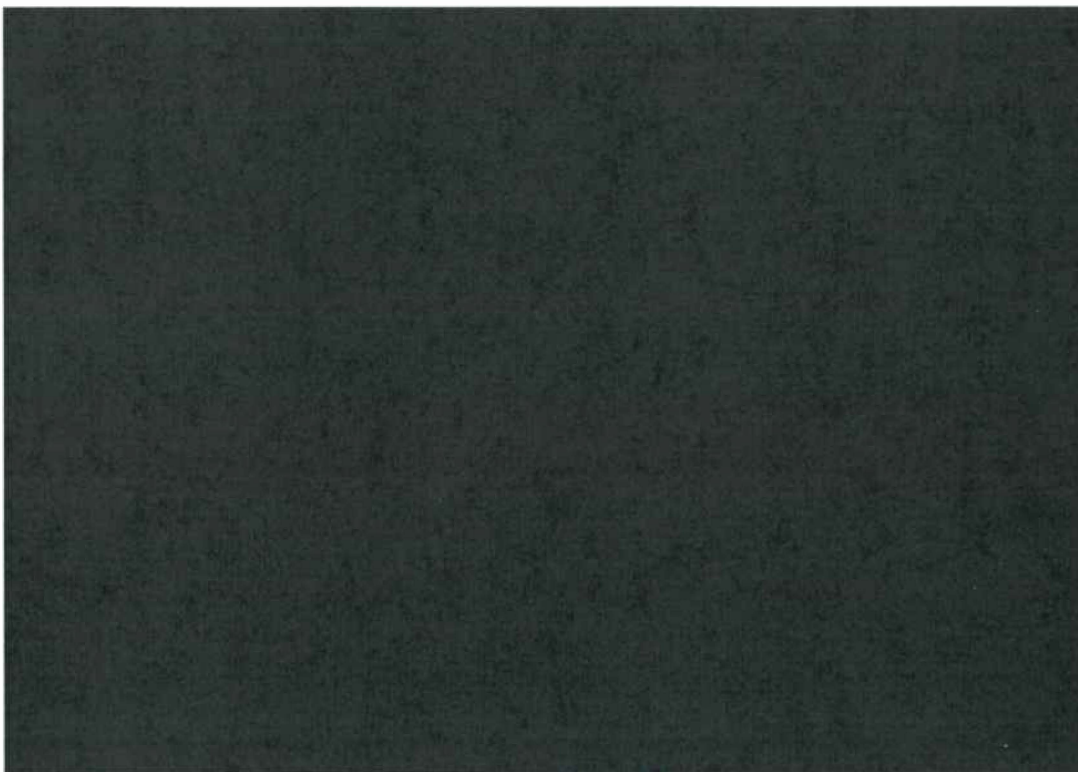
configuration and capacity to handle additional volumes or particular types of traffic, such as unit trains. *See* Norfolk Southern Opening Comments Ex Parte 711 Ehlers V.S. at 10-22 (detailing unique operating limitations of various interchanges on NS). And a receiving railroad cannot monitor the other carrier's network, leaving its own operations susceptible to unanticipated variability even if the interchange location can handle the interchange volumes.

As a result, each new interchange adds volatility into the network. By volatility, I mean uncertain and changing traffic demands to which Norfolk Southern must react through changes in resource deployment and, potentially, the operating plan itself. For example, **Figure 7** shows the volume of daily interchange traffic that Norfolk Southern received in Chicago from the Belt Railway Company of Chicago ("BRC") during a month-long period this year.

Figure 7

Cars Interchanged From BRC to Norfolk Southern in Chicago (Aug. 23 – Sept. 21, 2016)

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The daily volumes varied by more than 500% during the course of a single month, from a low of a little more than { [REDACTED] } cars on August 24, 2016, to a high of nearly { [REDACTED] } cars on September 10, 2016. These volume fluctuations trigger extra train requirements, placing a significant strain on Norfolk Southern's resources and slowing shipment velocity. Yet the STB's proposal would multiply the amount of traffic (and locations) that would experience these effects.

For all of these reasons, Norfolk Southern has recently undertaken an effort to reduce the volumes it interchanges through intermediate switch carriers by interchanging traffic directly to other carriers where possible. Direct interchanges allow Norfolk Southern to mitigate the impacts of volume fluctuations through greater control of its operations. As a result, Norfolk Southern can better manage and position resources such as crews and locomotives, while also achieving cost savings by avoiding switching charges.

Norfolk Southern also has worked to streamline its interchange operations with other carriers. Norfolk Southern detailed its efforts to consolidate interchanges with CSXT in its prior comments in Ex Parte 711. *See* Norfolk Southern Opening Comments Ex Parte 711 Ehlers V.S. at 10-11. Those efforts continue. In the past few years, Norfolk Southern and CSXT have closed 33 interchanges. Most of these interchanges had minimal volumes, on the magnitude of less than a carload per day. However, because those locations were still open and had traffic, each carrier had to reserve sufficient resources in the area. Those resources have now been redeployed to more effective uses. Conversely, a handful of these locations had more significant volumes, but consolidating traffic flows to other interchange points has allowed the carriers to increase shipment velocity in some cases while also realizing efficiency gains. For example, CSXT and NS now interchange traffic previously interchanged at three different locations

(Marion, IN, Indianapolis, IN, and Muncie, IN) in Anderson, IN, which permits consolidation of traffic from CSXT and several short lines into one interchange, reducing handlings and resource requirements while expediting the traffic. If customers in that area sought forced access under the STB's proposal, they could unbundle this consolidation and reinsert the inefficiencies that the service redesign successfully removed from the system.

Indeed, all of the efforts I've discussed would be unraveled by the STB's proposal. Each granted switching application would add additional handlings to the network, slowing shipment velocity. Some, like in Atlanta, would add significant and unnecessary mileage to the route. Even if the STB restricted forced switching geographically to existing interchange locations, the increased (and variable) volumes across those interchanges would increase the volatility of operations, like we have experienced with the BRC, requiring additional resources and resulting in less efficient operations. The STB's consideration of forcing carriers to switch cars at additional interchange locations not in use today would reverse the efforts that Norfolk Southern has made with other carriers for more efficient and improved customer service, such as in Anderson, IN.

III. BY INJECTING COMPLEXITY INTO THE NETWORK, THE STB'S PROPOSAL WILL HAVE PROGRESSIVE, CUMULATIVE IMPACTS THAT HARM ALL CUSTOMERS.

Amplified complexity and added uncertainty are the bane of good service, operating fluidity, and network resilience. Increased handlings and poor service go hand-in-hand and ripple beyond the narrow confines of a specific movement to harm innocent traffic as well. These hard truths about railroad operations are proven repeatedly by actual events.

The Board hopes to avoid degrading network efficiency by evaluating forced switching arrangements on a case-by-case basis. It aspires to "exercise a greater degree of precision when

mandating reciprocal switching, thus mitigating the chance of operational challenges in a given area.” Proposal at 17.

With the utmost respect, based on my 35 years of experience, it is simply inconceivable to me that the STB—with its limited resources and deliberate regulatory process—will be able to keep in check the proven consequences from injecting complexity and uncertainty into a rail network and from reinstating inefficiencies that railroads have worked to streamline, or to react in a timely manner to the near constant fluctuations of demand. And all rail customers will be harmed by any miscalculation.

A. The Negative Impacts of Introducing Even Feasible, Planned Switching Impacts Other Traffic.

Even if the STB were able to anticipate the exact traffic volumes and requirements imposed by each switching application—which it cannot—its proposal would nevertheless generate significant negative effects on all of Norfolk Southern’s traffic. As demonstrated above, each successive grant of forced switching would further increase the average number of handlings required per shipment, slowing network velocity and therefore degrading overall service. Car cycle times would increase for the subject traffic as well as other impacted traffic, straining resources across a network that relies upon shared utilization of common resources. Customers would respond by injecting more volume into the system to compensate for longer transit times. Slower shipment velocity would also increase the track capacity consumed by each carload, further affecting the fluidity of the network.

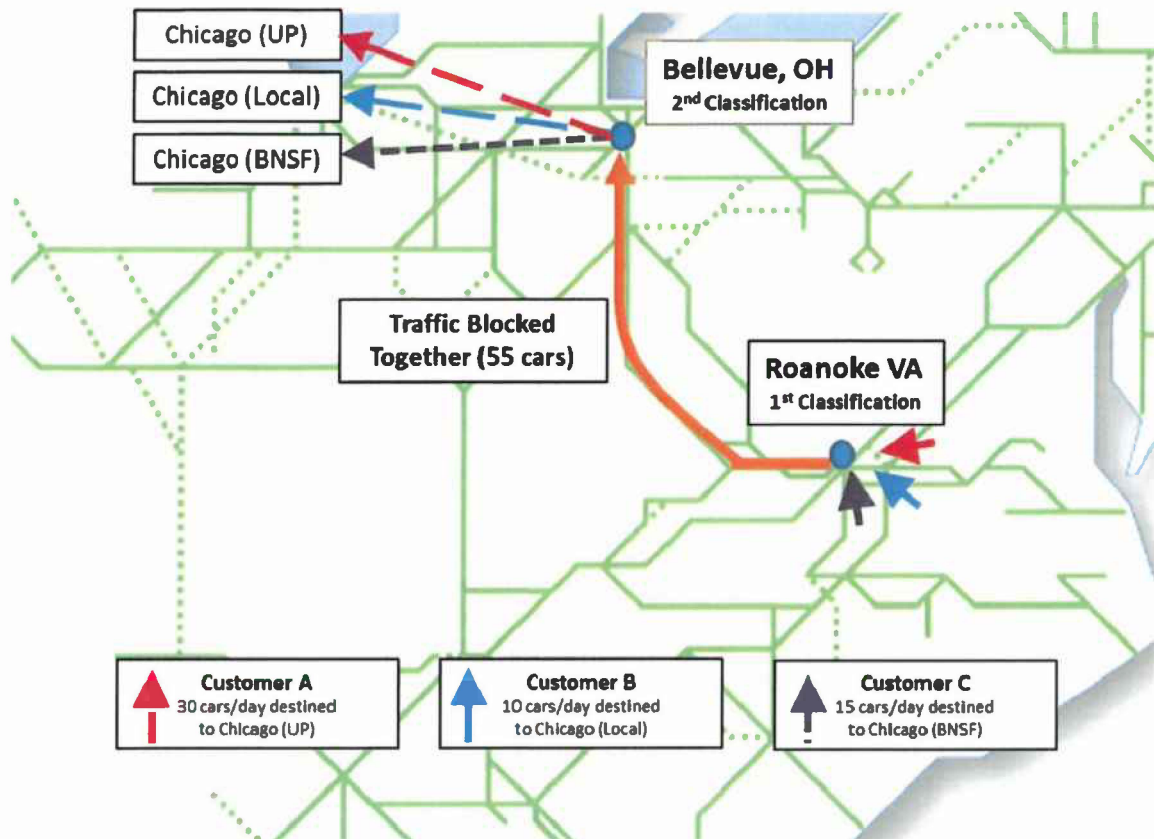
Similarly, additional locomotive and crew resources would be consumed moving the subject traffic to and from interchange locations. For new interchange locations, forced switching would necessarily require the participating carriers to establish new train services that do not exist today, whether between the new interchange and a customer location, a local serving

yard, or a classification yard. Even for existing interchange locations, service would need to be redesigned, and local trains might be required to make additional stops en route to move the subject traffic to and from the interchange. Increased interchange volumes may also necessitate the operation of additional trains and/or require additional track capacity. Consequently, crews and locomotives would not be available for all of their current uses, resulting in less frequent service to customer locations and/or greater delays in transit time for other traffic.

Additionally, by reducing long-haul volumes, the STB's proposal would impair Norfolk Southern's ability to handle non-subject traffic efficiently. As discussed above, the efficiencies Norfolk Southern can achieve are driven by the ability to build blocks of traffic moving between common origins and destinations of sufficient size that they can be grouped together to bypass handling in intermediate yards. But as subject traffic is switched to other carriers, these long-haul volumes would shrink or, at minimum, become less certain. The remaining traffic may be insufficient, or insufficiently predictable, to support continuing to building existing blocks, requiring Norfolk Southern to handle that non-subject traffic more often, with corresponding negative consequences for transit time and service.

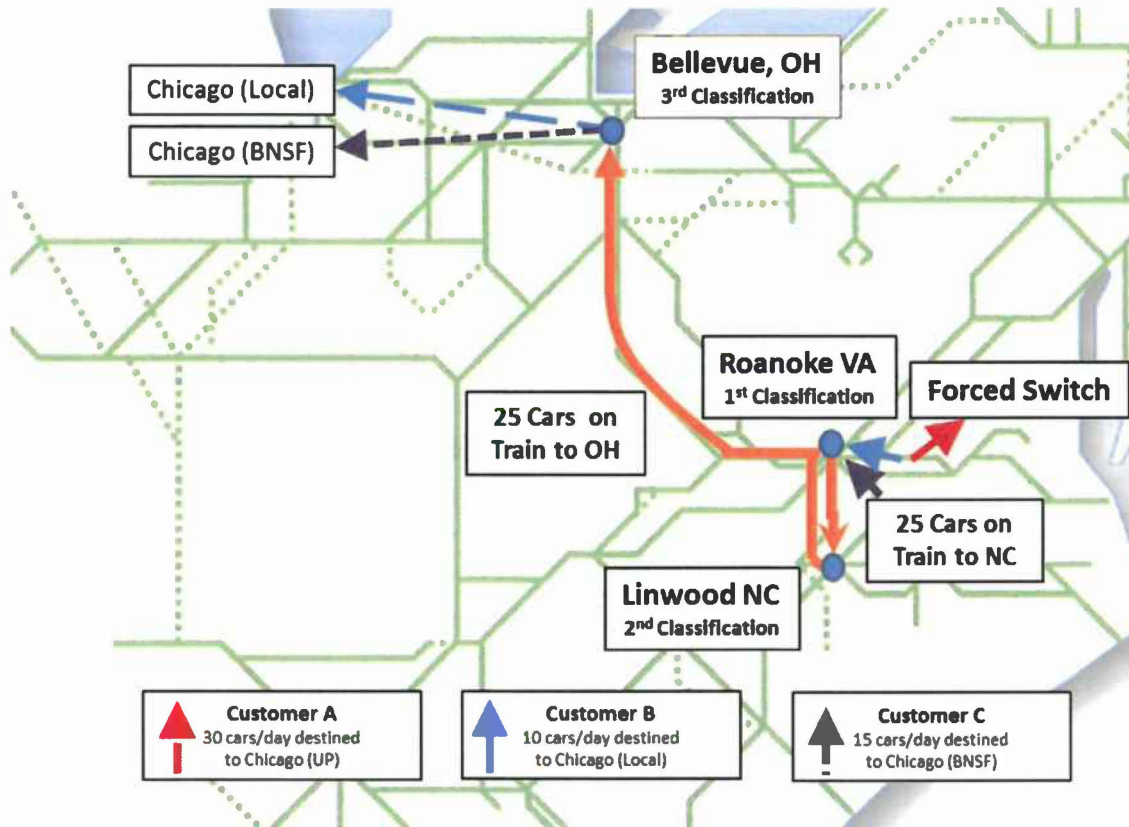
Figures 8 and 9 illustrate this point, taking from the example cited earlier of Norfolk Southern's recent creation of a new block moving from Roanoke, VA, to Bellevue, OH. In **Figure 8**, Norfolk Southern gathers hypothetical traffic from three customers in the greater Roanoke area destined to Chicago, either for interchange or local delivery. After classification, that traffic moves in a solid block between Roanoke and Bellevue, where it is reclassified and split up to move separately to its respective destinations.

Figure 8
Hypothetical Blocking Scheme Before Board Proposal – Roanoke, VA, to Bellevue, OH



By contrast, in **Figure 9**, Customer A takes advantage of the regulatory process to force Norfolk Southern to switch its traffic to another carrier. As a result, that volume is no longer available to combine with the remaining 25 carloads from Customers B and C. Lacking sufficient, predictable volumes to realize efficiencies by creating a sufficiently large single block for Bellevue, Norfolk Southern would instead resume sending those carloads with other traffic to Linwood, NC, where they would be reclassified and combined with additional volumes gathered in Linwood heading to Bellevue. In short, Customer A's decision to seek a forced switch results in an extra handling and longer transit times for Customers B and C to Chicago.

Figure 9
Hypothetical Blocking Scheme After Board Proposal – Roanoke, VA, to Bellevue, OH



Relatedly, carriers in many locations agree to “block swaps,” whereby each carrier builds specified blocks of interchange traffic for the other carrier prior to interchanging that traffic to that carrier. Such an arrangement permits the receiving carrier to move that traffic significant distances after the interchange without additional car handlings. Because these blocks provide no benefit to the originating carrier, such agreements are typically reciprocal in nature.

However, if new traffic is added to an existing interchange location, it may frustrate the benefits of those arrangements. For example, Norfolk Southern currently receives pre-blocked traffic from other carriers in Chicago that it is able to move directly to Bellevue Yard for further handling. If another carrier was forced by STB order to switch additional traffic to Norfolk Southern via that interchange, such traffic might not be destined to or handled through Bellevue.

Norfolk Southern then would have two options: (1) add an additional handling event for the whole train in another location, such as Elkhart, to permit classification of the new traffic; or (2) add an entirely new train to serve the interchange in Chicago for the new subject traffic, consuming additional resources and increasing congestion. In either case, the efficiency of Norfolk Southern's operations and the service that Norfolk Southern is able to provide to other customers would be negatively affected.

B. The STB Will Not Be Able to Foresee the Domino Effect of Individual Switching Decisions.

Perhaps the greatest misconception in the STB's proposed case-by-case approach is the implicit assumption that the Board will be able to foresee the traffic flows that will arise under each forced switching application and therefore predict the resulting impacts. The history of the railroad industry, including recent events, disproves any such belief.

At a macro level, Norfolk Southern operated an incredibly different railroad in 2010-2011 than it did in 2012-2013, and conditions are vastly different today from either of those periods. Major shifts in the economy and Norfolk Southern's commodity mix drove significant changes in traffic, from the quick rise and sharp contraction of crude oil traffic to the swift and steep decline in coal volumes. These changes were not foreseen or fully understood until after they had already occurred. Norfolk Southern's network itself also has not remained static. Since 2013, Norfolk Southern has expanded Bellevue Yard while ceasing hump operations in Knoxville, TN, and Roanoke, VA.

On a more granular level, unforeseen fluctuations are even more frequent. Norfolk Southern's customers are susceptible to major economic forces, weather, and other unanticipated changes that affect their transportation requirements. On top of that, their businesses ebb and flow due to a variety of individualized factors, such as specific shifts in market demand,

commodity prices, winning or losing particular contracts, and unanticipated operational issues such as plant failures. As a result, customers' own short-term forecasts about their transportation needs often miss the mark significantly. These inaccuracies are compounded when attempting to predict demand further into the future. Moreover, unanticipated volumes often arise when customers have issues handling their pipeline of traffic. In such cases, the issue is not the total number of carloads but the timing, whereby a customer ships an unusual amount of traffic all at once or is unable to handle incoming traffic, leading to accumulations.

As the examples below demonstrate, in addition to all of the predictable negative consequences that will flow from forced switching events, the inevitable inability to predict switching volumes will result in service issues for other traffic, both locally and more broadly.

1. Local Impacts of Unanticipated Switch Volumes

Unanticipated traffic demands can have serious negative impacts on unrelated customers located in the same geographic area or reliant on the same facilities. Local operations may be sufficiently staffed and have sufficient track capacity to handle normal volumes and demands. However, even one customer experiencing unusual activity can strain available resources. The STB's proposal would impose new demands on individual interchange locations, compounding this risk.

A recent occurrence on Norfolk Southern's Piedmont Division provides a good example. Norfolk Southern delivers traffic originating from a customer located in Canton, OH, to an interchange location in Asheville, NC. The customer unexpectedly had 100 cars (equivalent to five days' worth of traffic) build up in Asheville Yard awaiting interchange. This congestion directly impacted the eight active customers served out of Asheville Yard, because local crews exhausted their hours of service switching the yard and were unable to serve those customers as planned. Asheville Yard itself, which is normally capable of handling this interchange traffic,

ran out of room, requiring Norfolk Southern to set out traffic in sidings short of Asheville due to the congestion.

The ultimate consequence of this backup was that Norfolk Southern was forced to put an embargo in place on the customer temporarily limiting the amount of traffic the customer could send through Asheville. When the embargo is lifted, the customer likely will have backlogged volumes that will be pushed into the network in bunches, leading to further congestion and switching issues. The lasting impacts on network fluidity will take significant time to work through, all arising out of a single customer's interchange traffic.

Another recent example involved private empty equipment returning to a chemical customer location around Toledo, OH. Heavy volumes arose due to a force majeure event affecting a pipeline that normally carried significant quantities of the commodity, leading to an unexpected spike in rail demand. This unanticipated surge caused a capacity pinch whereby the cars accumulated in Homestead Yard in Toledo. As a result, Norfolk Southern did not have space to accept trains arriving at Toledo into the yard as planned, delaying placement of cars for local customers. Additionally, trains originating from Toledo destined for Bellevue were delayed because the capacity constraints prevented trains from being built on time. Those delays, in turn, cascaded into missed train connections and plan disruptions for the affected traffic, further delaying those shipments. This issue also has resulted in service delays to grain customers in Maumee Yard, about fifteen miles away. Norfolk Southern has worked with the customer to attempt to identify solutions, including construction by the customer of additional tracks, but the backlogged volumes will take time to work down.

2. Effects Can Quickly Spread Geographically

While service issues arise locally, in a connected network the effects are difficult to contain locally. Congestion at one location causes Norfolk Southern to hold trains at other

locations, rather than sending them on to further compound the problem. If the issue lingers, these holding locations themselves become congested from the impacted traffic, leading to further ripple effects throughout the system.

For example, for approximately six months in the middle of 2015, one of Norfolk Southern's shippers unexpectedly experienced a strong spike in demand from four customers around Dragon, MS. Traffic volumes increased from averaging around 10-15 cars per day to averaging more than 25 cars per day, with frequent spikes of more than 40 cars a day. As a result, Norfolk Southern had to add numerous extra train sections to its existing Bellevue to Birmingham train on which that traffic moved, disrupting normal operations. When demand exceeds a train's maximum length, some cars must be left behind to wait for the next train, consuming yard space and slowing transit times. Those cars in turn may displace cars intended to move on the following train, perpetuating the oversubscription. Eventually, Norfolk Southern was able to adjust the operating plan and add an additional scheduled train to handle the traffic.

Even once the cars made it to Birmingham, the customers were unable to accept the increased volumes at their facilities all at once. Those cars had to be staged somewhere while awaiting the customer's ability to accept them, so Norfolk Southern stored them at Birmingham Yard and at various locations and sidings outside the yard. Those cars consumed capacity in the yard and on that corridor, impacting yard and train operations, including Amtrak's Crescent service. When those impacts became apparent, Norfolk Southern rerouted the traffic 286 miles out of route to our yard in Sheffield, AL, to be switched and stored awaiting receipt by the customers. Traffic eventually returned to normal levels. But in the end, this one temporary fluctuation ended up requiring Norfolk Southern to redesign its service multiple times and affected multiple yards and numerous other scheduled services.

C. Impacts of STB's Proposal Will Compound

Both of these effects – the immediate service impacts of introducing additional handlings, and the consequences of unanticipated shifts in traffic subject to forced switching – will worsen with each additional grant of forced switching. Each new interchange event mandated by the STB will inject another area of volatility into Norfolk Southern's network. By placing more strain on Norfolk Southern's resources to handle existing traffic, the STB's proposal would both reverse many of the efficiency improvements Norfolk Southern has achieved through service design and make the overall system more susceptible to disruptions, like weather, that are beyond Norfolk Southern's control. Much like with its current operating plan, Norfolk Southern will not be able to predict exactly where and when those events will occur. But that does not make them any less real or certain.

IV. CONCLUSION

For decades, Norfolk Southern has striven with great success to provide the best possible service and reliability to all its customers by reducing handlings, minimizing complexity, and designing its services to maximize the use of our customers' and our own resources. The result has been lower operating costs, lower rates, and a streamlined network that can respond with more agility to unexpected stresses and quickly changing market conditions. The STB's proposal will turn back the clock by injecting complexity and adding intermediate handlings.

And the public will suffer in the end. The data presented above demonstrate that, by introducing forced switching, the STB's proposal would slow our network and reduce the service we are capable of providing to our shippers. A case-by-case analysis of each switching application cannot keep this result in check; the effects of increased car handlings go beyond the affected traffic and will accumulate as more applications are granted. Experience also

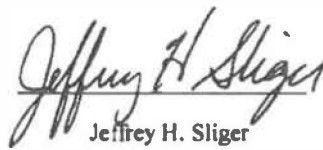
demonstrates that introducing more volatility into the system will result in additional instances of acute traffic congestion and service failures, with the potential to spread to the larger network.

Simply put, the STB's proposal would elevate the desires of certain individual shippers over the best interests of all shippers, to the detriment of Norfolk Southern's network as a whole.

Verification

I, Jeffrey H. Sliger, verify under penalty of perjury that I am Assistant Vice President Transportation Network of Norfolk Southern Corporation, that I have read the foregoing document and know its contents, and that the same is true and correct to the best of my knowledge and belief.

Executed on 10/20/2016



Jeffrey H. Sliger