BEFORE THE
SURFACE TRANSPORTATION BOARD

RECIPROCAL SWITCHING FOR INADEQUATE SERVICE

Docket No. EP 711 (Sub-No. 2)

OPENING COMMENTS OF NORFOLK SOUTHERN RAILWAY COMPANY

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INTRODUCTION

Norfolk Southern Railway Company ("NS") submits these comments on the Notice of Proposed Rulemaking ("NPRM") in this proceeding[1] and joins those submitted by the Association of American Railroads. NS thanks the Board for closing the prior docket in this proceeding and focusing on addressing service inadequacies with attention to data.

NS shares the Board's focus on quality rail service. NS works every day to offer the safe delivery of reliable and resilient service that allows for sustainable growth in rail transportation. Recently, NS created the industry's first ever Vice President of first mile/last mile markets and a new performance excellence team within operations—both innovative investments that reflect NS's commitment to quality service. In meeting diligently with, and listening to, its customers to understand their needs and suggestions, NS understands that customers need reliable and resilient service to grow and compete in their industries. NS is committed to partnering with its customers and earning their trust, being responsive to customer needs and feedback, and preventing or addressing service problems where necessary. With this customer-centric strategy, NS intends to enable new growth as transportation demand rebounds.

The Board's proposal could address service quality in a data-driven way in concert with NS's customer-centric strategy if deployed in a tailored manner. But great care must be taken not to do more harm than good. The STB has correctly observed that "even temporary access is a serious remedy, given the potentially

[1] Notice of Proposed Rulemaking and Closure of Subdocket No. 1, *Reciprocal Switching for Inadequate Service*, Docket No. EP 711 (Sub-No. 2) (STB served Sept. 7, 2023) ("NPRM").

significant operational, safety, and financial implications for the carriers involved."[2] Moreover, NS is under constant market pressure to improve its service product to meet its customers' demands. Government imposition of a "serious remedy" should be applied to only the narrowest set of cases where it can be shown that outcomes in unregulated markets are inconsistent with outcomes observed in competitive markets. Otherwise, the STB risks distorting markets rather than promoting them. It is therefore crucial that the execution of this new proposal complement the industry's market-driven work to improve service reliability, and not place those efforts in peril, to the detriment of customer service networkwide.

The NPRM is plainly a thoughtful effort to balance these conflicting considerations and promote the public interest. The level of detail is extraordinary and reveals the depth of work that went into crafting this proposal. Numerous features reflect learnings from prior public comments. And NS is mindful of the overarching goal voiced by the STB to move this proposal forward expeditiously. NS therefore focuses these comments on key ways to constructively improve this proposal:

- The final rule, while still utilizing service performance metrics, should adopt a less formulaic standard for ultimately deciding whether the unique circumstances of each case justify a temporary switching agreement;
- The final rule should require that the switch will remedy harm and improve service, given the potential safety and network implications of even a temporary remedy;
- The STB should promote private resolution of service disputes by requiring customers to bring their service concerns to the railroad's attention during the period of perceived inadequacy;
- As described by Dr. Mark Israel, the Board should improve the service performance metrics as follows:

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[2] Final Rules, *Expedited Relief for Service Inadequacies*, Docket No. EP 628, 3 S.T.B. 968, 977 (STB served Dec. 21, 1998) ("*EP 628 Final Rule*").

- ✓ Move from a rolling 12-week period of analysis to a quarterly period of assessment to avoid cherry-picking;
- ✓ Shift to an on-time performance metric that captures both the frequency and the degree of delays;
- ✓ Use a benchmark of competitive traffic to select the performance metric thresholds that indicate an uncommon level of service irregularity; and
- ✓ Use simple statistical tests so the STB can have confidence that the perceived problem is real and not caused by limited observations or noisy metrics.

- The STB should defer questions of compensation to individual cases, given its limited role; and
- The STB should not apply these new rules to private contract traffic, which would place in jeopardy the most customer-centric feature of the Interstate Commerce Act.

I. NS SUPPORTS A DATA-DRIVEN, METRICS-BASED SCREEN AND OFFERS THE FOLLOWING IMPROVEMENTS TO THE NPRM.

A. The Parties Should Be Permitted to Complement the National Performance Metrics with Case-Specific Information.

The NPRM proposes to use three service metrics to assess the adequacy of rail service.[3] The three metrics are based on original estimated time of arrival ("OETA"), transit time, and industry spot and pull, collectively referred to as the "Performance Standards."[4] These service metrics are useful for monitoring service performance. Indeed, NS considers the same types of metrics in the course of running its business.

But there is no single metric or formula (or combination thereof) that, standing alone, can speak to the adequacy of rail service—much less conclusively demonstrate a level of inadequate rail service that lawfully justifies a government-mandated change to two railroads' operations (including requiring the incumbent

[3] *See* NPRM at 2, 13–23.

[4] NPRM at 38–41 (proposed § 1145.2).

carrier to hand over its traffic to a competitor). NS serves thousands of different customers shipping different commodities over a network that is never static. While NS looks to metrics as indicators to further evaluate what conditions on the ground may be affecting service and what solutions NS can implement in response, metrics are never the end-all-be-all of the analysis.

For similar reasons, the Board should not rely exclusively on standardized metrics or formulas to determine whether it is in the public interest to prescribe a forced switch to remedy a service inadequacy.[5] NS respects the agency's desire to offer more simplicity and predictability when it comes to remedying service inadequacies, but a public interest standard is inherently context-specific. That said, in the adoption of any such metrics, NS encourages the Board to utilize well-calibrated and empirically supported service metrics[6] as a "threshold" that will make it easier and more straightforward for a customer to bring a service complaint to the Board. The Board can then assess such a complaint based on all relevant evidence.

This agency has recognized for over a century that many variables are relevant to its determination under the public interest prong of 49 U.S.C. § 11102(c).[7]. For example, in *Manufacturers Association of York, Pa. v. Pennsylvania Railroad Co.*, the ICC explained that when "determining what is 'in the public

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[5] *See* 49 U.S.C. § 11102(c).

[6] *See infra* section I.D.

[7] When adopting section 11102(c), Congress explained that the "practicable and in the public interest" "standard" under subsection (c) is "the same standard the Commission has applied for many years in considering whether to order the joint use of terminal facilities" under subsection (a). S. REP. NO. 96-470, at 42 (1979); H.R. REP. NO. 96-1430, at 116 (1980) (Conf. Rep.) (same). The Board's application of the public interest prong of section 11102(c) must therefore conform to the standard that the agency applied when analyzing the public interest in terminal facilities cases under what is now section 11102(a).

interest' in a given case, as antecedent to the affirmative exercise of this broad grant of power, we must take into consideration not only the interests of the particular shipper[] … involved but also the interests of the carriers and of the general public."[8]

Likewise, the agency has recognized that when making a determination under what is now section 11102(c), there are "no mechanical test[s] and the totality of the circumstances may be considered."[9] Even in the prior sub-docket of this proceeding, the Board recognized that "[i]mposing reciprocal switching on a case-by-case basis would … allow the Board to better balance the needs of the individual shipper versus the needs of the railroads and other shippers."[10] And when it adopted the original Part 1147 rules for temporary switching relief for service inadequacies, the STB concluded: "We do not believe that it is possible or appropriate to attempt to delineate or define in the abstract what constitutes adequate service for all traffic under all circumstances at all times. Rather, we remain convinced that such issues are best addressed on a case-by-case basis, under flexible general rules, because transportation needs and service difficulties can vary substantially."[11]

While well-calibrated and empirically supported service metrics can certainly be utilized by the Board as an important tool in its toolbox—and even as a threshold that will quickly permit a customer to file a valid complaint before the Board—the

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[8] 73 I.C.C. 40, 49 (1922).

[9] *Midtec Paper Corp. v. Chi. & N.W. Transp. Co. (Use of Terminal Facilities and Reciprocal Switching Agreement)*, 1 I.C.C.2d 362, 364 (1985) ("*Midtec I*").

[10] Notice of Proposed Rulemaking, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, Docket No. EP 711 (Sub-No. 1), at 14–15 (STB served July 27, 2016).

[11] *EP 628 Final Rule*, 3 S.T.B. at 975.

public interest prong of section 11102(c) requires a more flexible and nuanced showing than any set of national service metrics can, standing alone, establish.[12] For example, it is possible that a railroad could fail one of the proposed service metrics while adjusting its network to accommodate changes in customer needs, while still providing adequate service (and no harm) to its customers, where the railroad proactively informed its customers of the upcoming service fluctuations and thus enabled its customers to plan for and adjust their operations accordingly.

Or, consider a second example that is less theoretical. As the STB is aware, following the East Palestine derailment, NS undertook a comprehensive review of its safety protocols. Amongst the sea of projects it launched to improve resiliency and safety was a thorough reexamination of train makeup. Starting in March 2023, NS enhanced its train makeup guidelines out of an abundance of caution and to improve mainline safety, productivity, and long-term resilient service. While that operating change carried clear safety and service benefits, it also introduced temporary service disruptions for about a twelve-week period as the network absorbed and adapted to the changes associated with this initiative. Some customers experienced a temporary service degradation that very well could have

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[12] The public interest test in section 11102 requires some "actual necessity or compelling reason" (*i.e.*, "compelling need"). *Midtec I*, 1 I.C.C.2d at 364 (noting that public interest standard for joint use of terminal facilities and switching remedies "are identical"); *Cent. States Enters., Inc. v. ICC*, 780 F.2d 664, 668 (7th Cir. 1985) ("Congress intended that the standard to be used in applying the 'practicable and in the public interest' test be 'the same standard the Commission has applied in considering whether to order the joint use of terminal facilities.'"); *id.* at 678 (describing the "pre-Staggers Act cases … that describe the public interest standard," for what is now § 11102(c), including the ICC's statement that "some actual necessity or some compelling reason must first be shown before we] can find such action in the public interest"); *Delaware & Hudson Ry. Co. v. Consol. Rail Corp.*, 367 I.C.C. 718, 720 (1983) (recognizing that the *Jamestown* standard (195 I.C.C. 289, 292) of "actual necessity" applies to grants of reciprocal switching under the public interest prong of what is now section 11102(c)).

triggered the proposed Performance Metrics. Yet there would plainly be no compelling need for a forced switch in that instance, either as a matter of law or of good public policy. Indeed, it would be terrible public policy and a detriment to the public interest to punish a carrier for making network changes to improve rail safety and long-term service, or to discourage future similar network innovations.

In sum, NS supports the Board's use of well-calibrated and empirically supported service metrics, but those metrics should function as a threshold—making it easier for customers to file a valid complaint under the proposed rule—not as the end-all-be-all analysis. While broad standardized metrics can be valuable tools to help identify *potential* service inadequacies, individualized evidence is needed to determine whether the public interest requirement of section 11102(c) has been satisfied.

Accordingly, NS urges the Board to consider all relevant evidence when determining the need for a forced switch in each unique case. Carriers should have the right to defend themselves with any relevant evidence—including evidence that there is no service inadequacy or that the circumstances do not justify a forced switch—and should not be limited to the narrow affirmative defenses proposed. Such a flexible inquiry would ensure that the Board's remedial authority is firmly tied to the governing legal standard and is targeted at addressing harmful service failures that would be remedied by a forced switch, while protecting the broader network and other customers.

B. The Requested Switch Should Remedy an Identified Harm from an Ongoing Service Inadequacy.

A second way the STB can ensure its proposal comports with the statutory standard is to tailor the rule so that any forced switching that is ordered would in fact remedy the identified harm. Because forced switching can have negative

impacts on customers—including causing network disruptions, slowing operations, and undermining investment in the rail network—there must be clear evidence that a forced switch is necessary to effectively remedy an actual harm caused by an ongoing service inadequacy. Otherwise, the "actual necessity or compelling reason" standard is not satisfied, and an imposition of forced switching would do more harm than good to service levels.

This requirement is particularly important given the broad-brush nature of the proposed Performance Standards. For example, a 20% year-over-year drop in transit time may, for a particular customer, be entirely irrelevant so long as the railroad provides timely updates on expected service deliveries. Or a customer may experience harm from that reduction in service, yet the cause is a regional service disruption that is affecting alternative carriers equally, such that a forced switch to an equally struggling carrier would provide no relief but simply complicate network operations. Again, while broad standardized metrics can be valuable monitoring tools that can help identify *potential* service inadequacies, individualized evidence is needed to determine whether the customer is suffering a harm that can be helped by a temporary switching agreement.

The Board has previously recognized the logic and intuition of this concept. In crafting the current rules on temporary switching relief for service inadequacies, the STB clarified that the alternative carrier must be able to provide better service than the incumbent carrier is currently providing. "We consider that," said the STB, "to be implicit in the reason for providing relief under these rules, and we will deal with this matter on a case-by-case basis. We will authorize relief where the combination of the alternative carrier and the incumbent carrier will provide better service than the incumbent carrier is providing by itself."[13]

[13] *EP 628 Final Rule*, 3 S.T.B. at 978.

Yet this manifestly needed showing—that service would be improved by a temporary switch—is absent from the current NPRM. Rather, the right to this serious remedy is triggered simply if one of the three Performance Standards has been violated during any 12-week period in the past. As such, a customer would not be required to show that inadequate service has harmed them, or that a forced switch prescription would be an effective remedy, or that any inadequate service is currently ongoing that requires a remedy at all.

That is an unexplained departure from agency precedent and problematic, both from a policy and legal standpoint. Indeed, the agency's "power is corrective, not punitive" such that the "justification for [a] remedy is the removal of the violation."[14] As such, "[t]he … agency charged with th[e] choice [of remedy] has a heavy responsibility to tailor the remedy to the particular facts of each case so as to best effectuate the remedial objectives" of the statute.[15] Other federal courts have similarly held that an agency's remedy will be reversed where "it bears no rational relationship to the offense or the need for deterrence" or is "far greater than the total harm caused."[16] More broadly, federal courts have explained that "[o]ur legal system is built on the foundational principle that remedies are a means of

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[14] *Gilbertville Trucking Co. v. United States*, 371 U.S. 115, 129–30 (1962); *see also CSX Corp.—Control—Chessie & Seaboard C.L.I.*, 363 I.C.C. 518, 585 (1980) ("our power to make the terminal facilities of one carrier available to another is *remedial in nature*") (emphasis added); H.R. Rep. No. 104-311, at 93 (1995) (explaining that the ICC Termination Act ("ICCTA") "keeps bureaucracy and regulatory costs at the lowest possible level, consistent with *affording remedies only where they are necessary and appropriate*) (emphasis added).

[15] *Gilbertville Trucking*, 371 U.S. at 130; *Cape Air Freight, Inc. v. United States*, 586 F.2d 170, 180–82 (10th Cir. 1978) (same).

[16] *Monieson v. Commodity Futures Trading Comm'n*, 996 F.2d 852, 865 (7th Cir. 1993).

redressing wrongs,"[17] and thus "'[a] remedy must be tailored to a violation[,] [and] the nature of the violation determines the scope of the remedy.'"[18]

In light of these longstanding legal and agency precedents, NS urges the Board to make clear that it will not prescribe a forced switch—which carries potential operating, safety, and economic implications—unless the Board finds, based on the totality of evidence presented by the parties, that an ongoing service problem has harmed the shipper *and* that the combination of the alternative carrier and the incumbent carrier will provide better service than the incumbent carrier is providing by itself, thus remedying the harm.

C. The Final Rule Should Encourage Communication Between Customers and Carriers and the Private Resolution of Disputes.

NS supports regulatory efforts that promote communication and resolution of disputes between carriers and their customers. Especially in the context of a disruptive forced switching order, carriers should be given the opportunity to attempt to resolve any service inadequacy before regulatory intervention is sought. As such, NS agrees with the NPRM's requirement that customers must engage in good faith negotiations to resolve its dispute with the incumbent carrier.[19] However, NS believes that the NPRM could do more to encourage the private resolution of

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[17] *Bacon v. City of Richmond*, 475 F.3d 633, 638 (4th Cir. 2007) ("*Bacon*").

[18] *Wahi v. Charleston Area Med. Ctr., Inc.*, 562 F.3d 599, 615 (4th Cir. 2009) (quoting *Bacon*, 475 F.3d at 638); *see also People Who Care v. Rockford Bd. of Ed., Sch. Dist. No. 205*, 111 F.3d 528, 534 (7th Cir. 1997) ("the remedy must be tailored to the violation, rather than the violation's being a pretext for the remedy").

[19] NPRM at 24.

disputes, consistent with the Board's preference for the resolution of disputes through informal means in lieu of formal Board proceedings.[20]

The NPRM's five-day pre-filing negotiation requirement[21] is unlikely to achieve these benefits. Five days is not a realistic timeframe to expect a carrier to attempt to resolve a service problem that is of the magnitude that could require a forced switch. Further, as structured, the requirement does not actually encourage communication during the period of alleged service inadequacy (*i.e.*, the 12-week window). As such, the requirement would operate as a minor procedural requirement rather than a provision that encourages resolution of disputes and communication between carriers and customers.

NS suggests that, to bring a petition, customers must have communicated with the carrier to address the alleged service inadequacy during the period upon which its petition is based. The rule could provide that petitioners briefly summarize the discussions they had with the incumbent carrier during the complained-of period that were intended to resolve the alleged service inadequacy, similar to the current rules at 49 C.F.R. pt. 1147.[22] By encouraging communication between customers and carriers during the actual alleged service inadequacy, the Board would be promoting the resolution of disputes, consistent with the rail

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[20] *See, e.g.*, Notice of Proposed Rulemaking, *Joint Petition for Rulemaking to Establish a Voluntary Arbitration Program for Small Rate Disputes*, Docket No. EP 765, at 8 (STB served Nov. 15, 2021) ("The Board has frequently stated that it favors the resolution of disputes through the use of mediation and arbitration procedures, in lieu of formal Board proceedings, 'whenever possible.'") (quoting 49 C.F.R. § 1108.2(a) and citing *Bos. & Me. Corp.—Appl. for Adverse Discontinuance of Operating Auth.—Milford-Bennington R.R.*, AB 1256, slip op. at 10 (STB served Oct. 12, 2018)).

[21] *See* NPRM at 41 (proposed § 1145.4).

[22] *See* 49 C.F.R. § 1147.1(b)(1)(ii).

transportation policy at 49 U.S.C. § 10101(2) ("to minimize the need for Federal regulatory control over the rail transportation system").

D. The STB Should Refine Its Customer Service Metrics with Data-Driven Statistical Analysis

The STB can further improve its proposal by calibrating the Performance Standards with better data and established statistical tools. While NS appreciates the STB's commitment to data-driven decision-making, the proposed Performance Standard benchmarks are not grounded in robust data of industry-wide service performance, nor do they rely on any statistical or empirical tools to distinguish abnormal service disruptions from normal, industry-wide service volatility that is inherent in railroad network operations.

However, there is a wealth of data and statistical techniques available to assist the STB in improving its selected Performance Standards. To this end, NS retained Dr. Mark Israel of Compass Lexecon to examine the agency's service metrics and offer recommendations for how to improve them.[23] In the limited time provided for public comments, Dr. Israel focused his attention on the first of the three metrics—OETA—and proposes an approach to better detect unusual service levels that would merit a deeper case-specific inquiry into whether a temporary switching remedy is appropriate. He offers five specific recommendations:

1. Replace the rolling 12-week data inquiry with a fixed quarterly analysis to prevent cherry-picking.[24]
2. Replace the OETA metric with a metric that captures not merely whether a shipment is late, but how late.[25]

[23] *See* Exhibit A, Verified Statement of Mark A. Israel, Ph.D. ("Israel V.S.").

[24] *See id.* ¶¶ 34–35.

[25] *See id.* ¶¶ 33, 45–46.

3. Use service metrics for competitive traffic as a benchmark to identify volatility that is attributable to normal railroad operations.[26]
4. Rely on established statistical tools and the competitive benchmark service data to screen for potentially inadequate service.[27]
5. Follow best practices in the use of statical measures (like means or the difference between means) to inject a level of statistical confidence in the decision-making process.[28]

This data-driven analysis proposed by Dr. Israel would improve the proposed rule by ensuring that any Board decision is informed by a firmer empirical foundation and better calibrated performance standards. Dr. Israel emphasizes, however, that any generalized metric, even if better calibrated with a robust dataset and sound empirical techniques, cannot tell the complete picture.[29] Even tailored metrics cannot reveal whether service was inadequate, because many variables are at play when it comes to rail service and customer needs, operations, and impact. Dr. Israel therefore recommends that the Board still conduct a case-by-case inquiry to understand, *e.g.*, why the service problem occurred, whether the customer has been harmed, and whether a forced switch will remedy that harm.[30]

The Board can also improve its proposed metrics by ensuring the metrics take into account, and adjust for, regional differences that affect service. As the Board is aware, there are significant geographic differences in the rail network, in particular between the East and the West. NS must navigate physical realities that

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[26] *See id.* ¶¶ 36–37, 47–50.

[27] *See id.* ¶¶ 38–42, 51–54.

[28] *See id.* ¶¶ 55–56.

[29] *See id.* ¶¶ 6, 30, 32, 57.

[30] *See id.* ¶ 27 (noting that the proposed metrics do not offer the Board needed information about "the impact of poor rail performance on [the] shipper[], … [whether] a lack of competitive options are the source of any 'inadequacies' [in service,] or [whether] mandated competition is a reasonable remedy for those 'inadequacies'").

are different from those in the West—*e.g.*, higher density of overlapping and interacting rail lines, different traffic pattens, different weather patterns, different terminal areas, more operations in urban areas, more variety in length of haul, etc.—all of which impact operations and therefore service. The agency has recognized that "there are significant differences between the railroads as to geography, network, customer base, traffic volumes, [and] resources," among other things.[31] Yet the proposed Performance Standards are not tailored to reflect these regional, network, or customer-base differences. By contrast, Dr. Israel's proposals would improve overall the specificity of the performance standards to allow for a more accurate measure of carrier performance.

To be clear, NS is not proposing that the agency delay a final rule for the complex data work proposed by Dr. Israel. Rather, the STB should indicate that parties can submit this kind of statistical analysis—in addition to, or in lieu of, the proposed Performance Standards—in cases to show that the challenged service levels are (or are not) a reflection of normal volatility of railroad operations. This would permit the agency to accommodate the competing interests of issuing a final rule expeditiously and calibrating the Performance Metrics on a case-by-case basis in order to place them on a more robust empirical foundation.

But there are two recommendations from Dr. Israel that the Board could implement immediately. First, replace the rolling 12-week data inquiry with a fixed quarterly analysis. This would prevent cherry-picking and simplify the information a carrier would need to gather, maintain, and provide to its customers upon

[31] Supplemental Notice of Proposed Rulemaking, *U.S. Rail Serv. Issues—Performance Data Reporting*, Docket No. EP 724 (Sub-No. 4), at 22 (STB served Apr. 29, 2016). In its Uniform Railroad Costing System, the Board also recognizes regional differences, insofar as it has Eastern and Western regions.

demand.[32] Second, require parties to use simple statistical tests (*e.g.*, for the transit time performance metric, a T-test for the difference between means) to inject a 90% or 95% statistical confidence into the decision-making process.[33] Foregoing this rudimentary and bedrock feature of statistical analysis would be counterintuitive and counterproductive.

II. THE STB SHOULD DEFER COMPENSATION ISSUES TO INDIVIDUAL CASES.

The Board plays a limited role in setting compensation for switching agreements. Congress directed the Board to set compensation for a forced reciprocal switching agreement only "if the rail carriers cannot agree upon such conditions and compensation within a reasonable period of time." 49 U.S.C. § 11102(c)(1). In light of its limited role, the Board took a case-by-case approach to compensation when it adopted the current Part 1147 regulations. It should do the same here.

Nonetheless, the Board asks for comments on two alternative access pricing methodologies. The first methodology would be a cost-of-service approach that the agency used and then abandoned in the 1970s. This "cost of service" approach could, according to the STB, use ICC Terminal Form F (from 1964) or its current Uniform Rail Costing System. No explanation was offered for how the STB proposed to resurrect the ancient Form F or use its current costing system. The second alternative would be based on the SSW methodology, which has generally been restricted to circumstances where trackage rights have been imposed to remedy anticompetitive effects of a consolidation.

NS submits that neither proposal can be adopted on this record. The first proposal is a re-warmed fully allocated costs approach that, at a minimum, reflects

[32] *See* Israel V.S. ¶¶ 34–35.

[33] *See id.* ¶¶ 55–56.

an unexplained and unwise departure from 40 years of agency precedent[34] and sound economics[35] because it does not reflect the need for demand-based differential pricing that "is crucial to the viability of the industry." *Intramodal Rail Competition–Proportional Rates*, Docket No. EP 445 (Sub-No. 2), 1990 WL 287993, at *2 (STB decided April 17, 1990).

The second proposal lacks sufficient details to discern what the agency is proposing. "[T]o make criticism or formulation of alternatives possible," *Home Box*

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[34] *Switching Charges on Iron or Steel Scrap at Stockton, Ca.*, 356 I.C.C. 634, 638 (1977) ("[T]he fact that a proposed rate ... exceeds the fully allocated cost level, does not, in itself, justify a finding that the charge is in excess of a maximum reasonable rate."); *Kansas City Power & Light Co. v. The Kansas City S. Ry. Co.,* 361 I.C.C. 308, 323 (1978) (rejecting fully allocated cost approach used in *Shreveport*); *Intramodal Rail Competition*, 1 I.C.C.2d 822, 835 (1985) (rejecting fully allocated cost approach as compensation for forced switching as "arbitrary and economically unsound").

[35] *See* Inter*VISTAS* Consulting Inc., *Surface Transportation Board: An Examination of the STB's Approach to Freight Rail Rate Regulation and Options for Simplification*, at 21 (Sept. 14, 2016), *available at* https://www.stb.gov/wp-content/uploads/STB-Rate-Regulation-Final-Report.pdf ("Economists have long debated the issue of sharing the portion of costs that are not allocable in a manner that is the least arbitrary. The consensus among economists is that fully distributed costs should not be used due to their arbitrariness and the misallocation of resources they can produce."); Opening Comments of Norfolk Southern Railway Company, *Reciprocal Switching*, Docket No. EP 711 (Sub-No. 1) (filed Oct. 26, 2016), Verified Statement of Professor Mark Armstrong and Professor David Sappington, at 11 ("When the competition induced by forced access reduces the contribution to a rail carrier's fixed costs, the carrier's ability to undertake the investment required to deliver high-quality service to shippers on an ongoing basis can be jeopardized."); Opening Comments of CSX Transportation, Inc., *Reciprocal Switching*, Docket No. EP 711 (Sub-No. 1) (filed Oct. 26, 2016), Verified Statement of Robert Willig, at 16 (describing "a regulatory policy designed to compensate railroads ***only*** for the costs (inclusive of a reasonable return)" as a "recipe for disaster for railroads and shippers alike"); *see generally* Mayo & Sappington, *Regulation in a 'Deregulated' Industry: Railroads in the Post-Staggers Era,* 49 REV. IND. ORG. 203, 214 (2016) (citing economic literature showing "that the application of fully allocated costs for establishing rate ceilings can fundamentally undermine not only the ability to achieve efficient pricing but also the financial viability of the regulated enterprise").

Office, Inc. v. FCC, 567 F.2d 9, 36 (D.C. Cir. 1977), agencies must "describe the range of alternatives being considered with reasonable specificity," *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 549 (D.C. Cir. 1983). An agency thus cannot merely offer "general notice that a new standard will be adopted" without any real guidance regarding what the new rule will be or how it would work. *Horsehead Res. Dev. Co. v. Browner*, 16 F.3d 1246, 1268 (D.C. Cir. 1994) (per curiam). Here, the STB's description of the second proposal results in more questions than answers. For example, the Board states that *some* of the principles that inform the SSW methodology would apply in a switching fee context as well; but presumably some would not, and it is not clear which principles fall in which bucket. Furthermore, the Board states that the "Rental Income" in the SSW Compensation methodology would "have an analogy" in the form of an "Imputed Rental Income"—a term nowhere defined and an analogy nowhere explained in the proposed rule. In sum, no explanation was offered for how to transform a pricing methodology designed for one purpose to serve another.

Given the targeted nature of this proposal, NS believes the agency can defer switching compensation to individual cases. Disputes will be rare. This proposal targets service disruptions that create a compelling need for a temporary reciprocal switching agreement. If the carriers disagree over reasonable compensation terms in those circumstances, they can advocate before the agency for terms based on the particulars of the service disruption, existing precedent, the details of the new switching agreement, and sound economic principles.

III. THE BOARD MUST RESPECT AND PROTECT CUSTOMIZED AND CONFIDENTIAL RAIL TRANSPORTATION CONTRACTS.

The most customer-centric feature of the Interstate Commerce Act is the ability of railroads and their customers to enter into confidential rail transportation

contracts. Prior to 1980, individualized contracts were viewed with skepticism by the federal regulator and deemed almost *per se* unlawful. With the Staggers Act, Congress transformed the rail industry by empowering parties to enter contracts that were tailored to the particular service needs of individual customers. To assure the success of this initiative, Congress stripped the ICC of authority to enforce these transportation contracts, limiting remedies related to such service to those available under the state law selected by the parties. Congress therefore authorized the rail industry and its customers to use this tool free from any concern that the bargain struck between the parties would be subject to regulatory second-guessing.

The success of this program cannot be overstated. In 1979, Congress recognized that "the contract provision is among the most important in the bill," and that it would offer "significant transportation benefits" to "both shippers and carriers" in the forms of greater certainty with regard to demand and better planning and "allocation of equipment and other resources."[36] History proved Congress right. When it passed the ICC Termination Act of 1995, Congress explained that it was "retain[ing] the Staggers Act's very successful encouragement and legal authorization of customized and confidential rate contracts between shippers and carriers."[37] Each year, tens of thousands of customers exercise their right to negotiate and use customized contracts to secure transportation services that meet their individual needs. And, as Congress predicted, railroads in turn use the greater certainty fostered by these contracts in network design and to better allocate resources.

Whatever path the STB takes with this new proposal, NS urges the agency to avoid any impingement on this customer-centric contracts right. The Board has

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[36] S. REP. NO. 96-470, at 9, 24 (1979).

[37] H. REP. NO. 104-311, at 99 (1995).

requested comment on several questions pertaining to its authority to regulate rail transportation service that is occurring pursuant to an active transportation contract.[38] NS joins in AAR's comments explaining why 49 U.S.C. § 10709 prohibits the Board from taking any action that would—either directly or effectively—regulate rail service occurring under transportation contract. The plain language of section 10709 makes clear that rail service provided under transportation contract is wholly outside of the Board's authority to remedy: the "exclusive remedy" is "an action in [state or federal court]." Thus, the Board cannot "consider reciprocal switching requests from shippers that have entered into a valid rail transportation contract." NPRM at 27. Likewise, the "service that a carrier provided by contract" cannot be "the grounds for prescribing a reciprocal switching agreement," even if that prescription is imposed after the contract expired, *id.*, because such a prescription—regardless of when it is imposed—would be a "remedy" for purported service failures that occurred during the contract period.

NS writes separately to emphasize how adding a new federal remedy to all existing contracts would impair the success of this program to the detriment of everyone. Contracts involve the allocation of risk. Parties negotiate for a suite of rights and obligations that are customized to the needs of the customer and the network capabilities of the carrier. Risks of non-performance by either party are allocated and addressed. The parties then negotiate a commercial rate for the bundle of rights agreed to in the contract. The bargain struck is then enforced by a state court with no authority to supplement or change the nature of that bargain after-the-fact.

Adding a new federal remedy (a mandatory switch) to the bargain struck by the parties would fundamentally alter the bundle-of-rights agreed to in the contract.

[38] NPRM at 27.

It would, in essence, become a mandatory supplemental federal remedy overlayed upon the contract remedies negotiated between the parties. That would, in turn, require the commercial rate offered by the carrier in every single contract to reflect the risk of that additional federal remedy. And perhaps the most pernicious problem is that the parties would be unable to contract around that federal remedy—no contractual provision could bind a shipper to not seek relief if the STB claimed the authority to supplement the remedies of those commercial contracts.

As such, the STB should make clear that it will not apply this new proposal to transportation that is governed by section 10709 contracts. Even unresolved questions regarding a potential regulatory intrusion into private contracts would imperil one of the most successful and customer-centric features of the Interstate Commerce Act. It is required by law, and certainly in the public's interest, that the Board respect and protect the private nature of rail transportation contracts.

CONCLUSION

NS thanks the Board for considering these suggestions on how to amend this newly proposed program to ensure it would work consistent with the statute and the Board's stated intent—to create a targeted tool that can remedy service inadequacies and encourage reliable rail service.

Respectfully submitted,

/s/ Raymond A. Atkins
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Dated: November 7, 2023

EXHIBIT A

Verified Statement of
Mark A. Israel, Ph.D.

BEFORE THE
SURFACE TRANSPORTATION BOARD

RECIPROCAL SWITCHING FOR INADEQUATE RAIL SERVICE

Docket No. EP 711 (Sub-No. 2)

VERIFIED STATEMENT OF

MARK A. ISRAEL, Ph.D.

November 6, 2023

I. INTRODUCTION

A. QUALIFICATIONS

1. My name is Mark A. Israel. I am a Senior Managing Director at Compass Lexecon, an economic consulting firm where I have worked since 2006. I am the head of Compass Lexecon's North American antitrust business. From 2000 to 2006, I served as a full-time member of the faculty at Kellogg School of Management, Northwestern University. I received my Ph.D. in economics from Stanford University in 2001.

2. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—and applied econometrics. At Kellogg and Stanford, I taught graduate-level courses covering topics including business strategy, industrial organization/competition economics, and econometrics. My research on these topics has been published in leading peer reviewed economics journals including the American Economic Review, the Rand Journal of Economics, the Review of Industrial Organization, Information Economics and Policy, and the Journal of Competition Law and Economics, among many others.

3. My work at Compass Lexecon has focused on the application of economic theory and econometric methods to competitive analysis of the impact of mergers, antitrust issues including a wide variety of single-firm and multi-firm conduct, class certification, and damages estimation. I have analyzed these competition issues on behalf of a wide range of clients, including private companies and government entities. I have submitted expert reports, declarations, and affidavits to government agencies and federal and state courts. I have testified in federal court, multiple state courts, and in many regulatory and arbitration proceedings in the U.S. and other countries. I have presented competitive analyses to the U.S. Department of Justice and the Federal Trade Commission on dozens of occasions. My work has included analysis of competition in many transportation-related cases, including previous submissions to the Surface Transportation Board ("STB" or "the Board"), as well as cases involving airlines, barges, food distribution, and many others. My curriculum vitae is attached as Exhibit A.

B. ASSIGNMENT AND PRIMARY CONCLUSIONS

4. I have been asked by Norfolk Southern ("NS") to comment on the Board's September 7, 2023 Notice of Proposed Rulemaking ("2023 NPRM") regarding "reciprocal switching for inadequate service."[1] The 2023 NPRM proposes "a new set of regulations that would provide for the prescription of reciprocal switching agreements to address inadequate rail service, as determined using objective standards[.]"[2]

5. Specifically, I have been asked to assess the standards the Board proposes to use to identify "inadequate rail service" that would trigger a mandated reciprocal switch.[3] I have also been asked to improve upon the Board's proposed method and suggest an alternative analysis that would allow the Board to use metrics of rail service performance to identify where further scrutiny is warranted and to determine whether regulatory intervention is necessary after further analysis.

6. My primary conclusions are as follows:

- The proposed use of objective measures of service quality could be useful for monitoring rail service and identifying potential service problems in the rail industry.
- The Board's proposed "Performance Standards" —which consist of thresholds for Original Estimated Time of Arrival plus 24 hours ("OETA+24"), transit time, and industry spot and pull ("ISP") data—are based on anecdotal evidence, and they are not tied to reliable empirical evidence, economic principles, or statistical analysis. As such, they fall short of the Board's stated goal of identifying "objective standards"[4] that can reliably identify "a minimum level of rail service below which regulatory intervention may be warranted[.]" [5]

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1 *Reciprocal Switching for Inadequate Service*, Docket No. EP 711 (Sub-No. 2), Decision, Surface Transportation Board, decided September 5, 2023 (hereinafter, "*2023 NPRM*").

2 *2023 NPRM* at 1.

3 *2023 NPRM* at 1.

4 *2023 NPRM* at 1.

5 *2023 NPRM* at 2.

- Regulatory intervention in markets, particularly in the form of policies that mandate competitive rail options for shippers, is appropriate only in a narrow set of cases: those where it can be shown that outcomes in those markets are inconsistent with outcomes observed in competitive markets.

- As currently proposed, the metrics around which the Board builds its proposed standards—OETA+24, transit time, and ISP—provide limited information about the adequacy (or inadequacy) of service on any particular lane.

- With respect to the Service Reliability standard, the analysis of OETA+24 data could provide a reasonable *starting point* for identifying service failures that *may* warrant additional analysis. However, there are several limitations with the proposed methodology:

    - The analysis of OETA+24 data proposed by the Board treats all delays equally—a delay of one hour past OETA+24 is given equal weight as a delay of three, five, or even ten days. Thus, this means the proposed Service Reliability standard offers the Board no way to differentiate relatively minor delays that may have little impact on shippers from severe delays that impose significant costs on shippers. As a result, it would be possible for a shipper to demonstrate that a carrier has failed to meet the Service Reliability standard—and the Board could prescribe mandated switching—based on a group of shipments that experience delays of just a few hours. This could result in a mandated reciprocal switch where none is needed, with the associated market distortions and negative effects to the public interest that are well-known.

    - The Board's proposal allows complaints to be based on the 12-week period of the shipper's choosing. This allows shippers to search for a period in which a carrier has failed to meet the proposed standard and could result in cases being brought simply because a shipper defined a period to include (or exclude) particularly favorable (or unfavorable) data, even if that period does not represent the carrier's general performance.

    - The Board's proposal to mandate competition as a remedy for "inadequate service" implies that the "inadequate" service is caused by a lack of competition. Yet, the proposed standards do not include any analysis of competitive market outcomes on which to base that finding. Without some basis to determine the expected range of competitive outcomes and test whether the petitioner's traffic lies outside those outcomes, the Board has no basis to conclude that mandated competition is necessary.

    - Finally, using the system-wide average on-time performance of four carriers as the threshold to define "inadequate service" does not properly account for the

normal variation around any average and is not an effective method for identifying potential market failures that warrant additional regulatory scrutiny.

- In light of these limitations, the Board should implement the following modifications to the Service Reliability standard to address these limitations:
    - Replace the proposed analysis of OETA+24 with a Service Reliability Ratio ("SRR") that identifies whether there was a delay and provides a measure of the severity of the delay. The SRR expresses delays as a proportion of the original estimated acceptable service window and is calculated as Actual Trip Duration divided by OETA+24.
    - Define specific periods of analysis (annual quarters, for example) that eliminate the opportunity for shippers to base complaints on a particularly favorable 12-week period of their choosing.
    - Identify a set of competitive benchmark traffic and calculate a threshold SRR—the upper bound of the range of expected outcomes in a competitive market—against which a complaining shipper's traffic can be assessed.
    - Compare the mean SRR of the traffic at issue to the threshold SRR to assess whether the service received by the complaining traffic was outside the range of expected outcomes based on the competitive benchmark.
- These modifications are an important first step in improving the Board's analysis, but any standard should be used only as a screen and not as the sole basis for defining "inadequate service" or prescribing a reciprocal switch. Such a finding would require more in-depth analysis.
- Some or all of the methodological changes I recommend in the context of the Service Reliability standard—establishing fixed periods of analysis, introducing a competitive benchmark, and relying on statistical tests to establish relevant thresholds—may also be relevant to the Board's other proposed standards. However, given the time allotted by the Board, I have focused my analysis and recommendations on the Service Reliability standard.
- Even if the Board decides to implement the proposed standards without any modifications, standard statistical tests should be incorporated into the Board's analysis to ensure that the analysis identifies service issues that are sufficiently different from normal fluctuations in service such that further regulatory consideration is warranted.

II. THE BOARD'S RECIPROCAL SWITCHING PROPOSAL

A. BACKGROUND

7. In July 2016, the Board issued a Notice of Proposed Rulemaking with respect to reciprocal switching regulations ("2016 NPRM").[6] In 2021, the Board solicited written comments on the 2016 NPRM and in March 2022, the Board held a hearing on the proposed regulations.[7] In the 2016 NPRM, the Board proposed mandating competitive access as a mechanism to provide shippers with "competitive rail service" where it was "practical and in the public interest" and where inter- and intramodal competition "is not effective."[8] I filed written comments on the Board's 2016 NPRM and participated in the March 2022 hearing.[9]

8. On September 7, 2023, the Board issued a decision that declined to adopt the rules proposed by the Board in EP 711 (Sub-No. 1) and closed that docket.[10] In the same decision, the Board opened a new subdocket, EP 711 (Sub-No. 2), and issued a new set of proposed regulations that "would provide for the prescription of reciprocal switching agreements to address inadequate rail service, as determined using objective standards based on a carrier's original estimated time of arrival, transit time, and first-mile and last-mile service."[11] The Board further explained that its change in focus is intended to address "recurring service problems" and remedy "inadequate service"[12] and that the "objective and transparent standards, defenses, and

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6 *Reciprocal Switching*, Docket No. EP 711 (Sub-No. 1), Decision, Surface Transportation Board, decided July 25, 2016 (hereinafter, "*2016 NPRM*").

7 *Reciprocal Switching*, Docket No. EP 711 (Sub-No. 1), Notice, Surface Transportation Board, decided December 27, 2021.

8 *2016 NPRM* at 16, 19.

9 *Verified Statement of Mark A. Israel*, Docket No. EP 711 (Sub-No. 1), February 14, 2022; *Hearing on Reciprocal Switching*, Surface Transportation Board, March 16, 2022.

10 *2023 NPRM* at 1.

11 *2023 NPRM* at 1. The new regulations proposed in the 2023 NPRM are intended as an addition to—rather than a modification or replacement of—the Board's current regulations governing the prescription of a reciprocal switching arrangement (*2023 NPRM* at 6.).

12 *2023 NPRM* at 5 ("Given the major service problems subsequent to the 2016 NPRM and the history of recurring service problems that continue to plague the industry, the Board has concluded that it is appropriate, at this time, to focus reciprocal switching reform on addressing inadequate service.").

definitions" in the new proposal will "provide appropriate regulatory incentives to Class I carriers to achieve and to maintain higher service levels on an ongoing basis."[13]

9. Although the trigger for mandating competitive access in the 2023 NPRM is "inadequate service" (rather than ineffective competition, as it was in the 2016 NPRM[14]), the remedy—mandating competition via reciprocal switch—is the same. The implication of using competition as a remedy for inadequate service is that a lack of competition must have been the cause of the issue. As such, the current proposal should be evaluated in the context of the same economic principles that I articulated in my comments on the prior proposal and that I reiterate below.

B. ECONOMIC PRINCIPLES FOR RAIL REGULATION

10. The principle that competition should be relied on whenever possible, and that regulation should seek to mimic competitive outcomes where government intervention is necessary, is the guiding principle of rail regulation.[15]

11. In the rail industry, competition does not always take the form of multiple competing rail options for a given movement.[16] Railroad transportation requires substantial fixed costs and any new rail lines require expensive capital.[17] If all moves had competitive rail options and this led to all movements being priced at marginal costs—a likely result—railroads would not be able to earn a competitive return on the capital deployed in the rail network, meaning they would lose the ability to attract capital, which would lead to reduced investment, reduced output, and ultimately harm to shippers.[18]

12. Therefore, policies aimed at mandating competitive rail options for shippers should be carefully designed and applied to only a narrow set of cases where it can be shown that outcomes in unregulated markets are inconsistent with outcomes observed in competitive markets. Even

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[13] *2023 NPRM* at 5.

[14] *2016 NPRM* at 19.

[15] 49 USC § 10101.

[16] *See* Mayo, John W. and Willig, Robert D. (2018), "Economic Foundations for 21st Century Freight Rail Rate Regulation," Georgetown McDonough School of Business Research Paper No. 3286211, available at: https://ssrn.com/abstract=3286211 (hereinafter, "*Mayo and Willig*") at 3.

[17] *See Mayo and Willig* at 3-4.

[18] *See Mayo and Willig* at 7-8.

then, regulations should provide a clear and effective method for identifying those situations in which mandated access is necessary.

C. SUMMARY OF CURRENT PROPOSAL

13. The proposal set forth in the 2023 NPRM establishes three "Performance Standards"—Service Reliability (OETA), Service Consistency (Transit Time), and Inadequate Local Service (Industry Spot and Pull (ISP))—that each "provide an independent path for a petitioner to obtain prescription of a reciprocal switching agreement[.]"[19] Under the current proposal, a petitioner would be eligible for a prescribed reciprocal switching agreement if: (a) the carrier fails to meet at least one of the three standards[20]; (b) the petitioner establishes that it has "practical physical access to only one Class I carrier;"[21] and (c) the carrier is unable to establish an "affirmative defense."[22]

1. Performance Standards

14. The proposal sets forth three service performance standards to be "applied across Class I rail carriers and their affiliated companies."[23]

(a) Service Reliability (OETA)

15. The Service Reliability standard measures a rail carrier's "success in delivering a shipment near [the] OETA…provided [by the railroad] when the shipper tendered the bill of lading for shipment."[24] The proposed OETA analysis, which would apply to manifest shipments only, compares actual delivery times to original estimated arrival times for a given lane[25] over a

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[19] *2023 NPRM* at 8.

[20] *2023 NPRM* at 8.

[21] *2023 NPRM* at 23.

[22] *2023 NPRM* at 25. The *2023 NPRM* also addresses other issues, including the practicality of a proposed switch, treatment of exempt and contract traffic, compensation for the switch, and terms and conditions under which a switch will occur.

[23] *2023 NPRM* at 13.

[24] *2023 NPRM* at 13.

[25] The *2023 NPRM* notes "For the purposes of part 1145, a lane is determined by the point of origin and the designated destination as well as by the commodity. Shipments of the same commodity that have the same point of origin and the same designated destination are deemed to travel over the same lane." (*2023 NPRM* at footnote 18.)

12 week period and would trigger a reciprocal switching prescription if less than 60% of shipments were delivered within 24 hours of their OETA.[26] I refer to the Board's OETA plus 24-hour grace period as "OETA+24" in this report.

16. The Board notes that the proposed 60% threshold was determined based on data related to trip plan compliance that carriers are required to submit under a separate docket, EP 770 (Sub-No. 1).[27] The 60% threshold was chosen because it "falls near the average manifest traffic performance levels that the largest carriers themselves regarded as not meeting public expectations…and thus would serve as a useful indicator of adverse effects on the public interest."[28]

(b) Service Consistency (Transit Time)

17. The Service Consistency standard is intended to measure "a rail carrier's success in maintaining, over time, the carrier's efficiency in moving a shipment through the rail system."[29] The proposed Service Consistency standard measures average transit time for shipments over a given lane over a 12-week period and compares the current transit time to the average transit time for the same shipment over the same 12-week period from the previous year.[30] With respect to loaded cars, a reciprocal switch would be triggered if the current transit time has increased by either 20% or 25% from the previous year.[31] The Board also notes that "deliveries

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[26] *2023 NPRM at 15*. The Board also seeks comment on alterative thresholds for triggering a prescribed reciprocal switch. *See, e.g., 2023 NPRM* at 15 ("Another approach would be to set the success rate at 60% in delivering a shipment within 24 hours after the OETA during the first year following the effective date of the proposed part 1145. After the first year, the success rate would increase to 70% in delivering a shipment within 24 hours after the OETA. The Board seeks comment on whether, if it chooses this approach, the performance standard should be increased to an even higher level after the second year.").

[27] *2023 NPRM* at 14-15.

[28] *2023 NPRM* at 15.

[29] *2023 NPRM* at 17.

[30] *2023 NPRM* at 18.

[31] *2023 NPRM* at 18. The Board seeks comment on what level of increase in transit time should be established in the final rule.

of empty system cars and empty private cars would also result in the prescription of a reciprocal switching agreement for the corresponding outgoing traffic."[32]

18. The Board explains that the proposed increased transit time threshold (i.e., an increase of either 20% or 25% from the previous year) is "based on its understanding of the rail network and available data."[33] The data referenced by the Board include testimony offered by "several shippers" during an April 2022 hearing in the EP 770 docket.[34]

(c) Inadequate Local Service (Industry Spot and Pull)

19. The Inadequate Local Service standard is intended to measure "a rail carrier's success in performing local deliveries ("spots") and pick-ups ("pulls").[35] This standard would be applied to loaded and unloaded, private or shipper-leased cars and is meant to measure "last mile" performance that is not necessarily captured in the Service Reliability standard. [36]

20. The local service standard would compare the number of times a carrier completed a shipper's requested delivery or pick-up within the planned service window to the total number of pick-up and delivery requests made by the shipper in a 12-week period. A petitioner would be eligible for a reciprocal switch prescription if less than 80% of the carrier's deliveries or pickups were made within the planned service window.[37]

21. The Board notes that the 80% threshold for the local service standard is based on average "industry spot and pull indicators" submitted by carriers in the EP 770 docket.[38] As with the service reliability standard, the Board notes that the 80% threshold reflects carrier performance during a period when "service fell short of expectations" and that these "averages are a reasonable starting point for setting standards for poor or inadequate local service."[39]

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32 *2023 NPRM* at 18.

33 *2023 NPRM* at 18.

34 *2023 NPRM* at footnote 26.

35 *2023 NPRM* at 19.

36 *2023 NPRM* at 19.

37 *2023 NPRM* at 19.

38 *2023 NPRM* at 20.

39 *2023 NPRM* at 20.

2. Practical Physical Access to Only One Class I Carrier

22. Under the current proposal, prescribed reciprocal switching agreements would be available only to shippers that can demonstrate they have "practical physical access to only one Class I carrier that could serve" the lane in question."[40] The Board notes this provision was included because "the Board expects, as a general rule, that there would be little benefit from prescribing reciprocal switching agreements for petitioners that have practical access to another Class I carrier that is capable of handling their needs."[41]

23. The proposal notes that there are multiple ways a petitioner may have practical physical access to multiple carriers: (1) direct service from multiple Class I railroads or their affiliated companies; (2) existing reciprocal switching arrangements; or (3) other negotiated access such as terminal trackage rights, or contracted access.[42]

3. Practicability

24. The proposal also requires that the mandated reciprocal switch be practicable. As an initial matter, the proposal assumes that a prescribed reciprocal switching agreement would be practical because, under the proposal, a mandated reciprocal switch is available only within a terminal area.[43] The proposal does allow carriers to raise arguments with respect to the practicability of a mandated switch, but imposes the burden of proof on the objecting rail carrier to establish infeasibility or undue impairment.[44] The proposed regulations also note that "[i]f the incumbent rail carrier and alternate rail carrier have an existing reciprocal switching arrangement in a terminal area in which the petitioner's traffic is currently served, the proposed operation is presumed to be operationally feasible, and the incumbent rail carrier will bear a heavy burden of

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40 *2023 NPRM* at 23.

41 *2023 NPRM* at 23.

42 *2023 NPRM* at 23.

43 *2023 NPRM* at 26.

44 *2023 NPRM* at 26-27 ("[T]he Board would consider whether the switching service could be provided without unduly impairing the rail carriers' operations. The Board would also consider an objection by the alternate rail carrier or incumbent rail carrier that the alternate rail carrier's provision of line-haul service to the petitioner would be infeasible or would unduly hamper the objecting rail carrier's ability to serve its existing customers.") *See, also*, NPRM at 42-43.

establishing why the proposed operation should not qualify for a reciprocal switching agreement."[45]

4. Affirmative Defenses

25. In the event a carrier fails one of the three tests outlined above, the proposed regulations include a provision that offers carriers the opportunity to establish an affirmative defense and avoid a switching prescription.[46] The proposal outlines a limited set of pre-authorized affirmative defenses available to carriers, including: extraordinary circumstances beyond the carrier's control, a surprise surge in petitioner's traffic, highly unusual shipment patterns, and delays caused by third parties.[47] Carriers may also present defenses that fall outside these categories, which will be evaluated by the Board on a "case-by-case" basis.[48]

III. ANALYSIS OF THE BOARD'S PROPOSED STANDARDS

26. The Board explains that the revised proposal offered in the 2023 NPRM is intended to establish "objective performance standards"[49] that can reliably identify "a minimum level of rail service below which regulatory intervention may be warranted."[50] The Board's effort to develop a method, based on reliable and objective data and analysis, for identifying a narrowly tailored set of traffic where mandated competitive access may be appropriate is commendable. However, the Board's current proposal falls short of this goal in several specific ways, leading to my proposed changes below.

27. The various metrics proposed by the Board—OETA performance, changes in transit time, and ISP performance—provide limited measures of the adequacy (or inadequacy) of service on any particular lane. They do not offer the Board information about the impact of poor rail performance on shippers, and they provide no information to demonstrate that a lack of

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45 *2023 NPRM* at 26.

46 *2023 NPRM* at 25.

47 *2023 NPRM* at 25-26.

48 *2023 NPRM* at 25.

49 *2023 NPRM* at 1.

50 *2023 NPRM* at 2.

competitive options are the source of any "inadequacies" or that mandated competition is a reasonable remedy for those "inadequacies."

28. For example, the proposed OETA+24 metric measures only whether a shipment arrives more than 24 hours after its OETA or not, but offers no information about the severity of the delay or the potential impact on shippers. Nothing about the OETA+24 metric distinguishes whether a shipment is late by a matter of hours or by a matter of days. Consider two shipments in a given lane, both with an OETA of three days (72 hours). Shipment A is delivered 25 hours after the OETA and is therefore one hour late under the Board's proposed OETA+24 metric. Shipment B is delivered 6 days after its OETA and is therefore 5 days—or 120 hours—late under the Board's OETA+24 metric. The current proposal treats both shipments as having received equally "inadequate" service and gives them equal weight in determining whether a carrier has missed the 60% threshold for on-time performance proposed by the Board. Therefore, under the current proposal, it is possible that a shipper could demonstrate that a carrier has failed to meet the Board's proposed 60% threshold based *only* on shipments that were delivered within hours of the acceptable service window. This could result in mandated switching where it is not needed, with the associated market distortions and negative effects to shippers and the public.

29. Likewise, the transit time and ISP metrics also offer limited information with respect to the existence of—or appropriate remedies for—any service "inadequacies." For example, transit times can be adjusted for many reasons— track maintenance, changes in schedules of other railroads sharing track or facilities, or other aspects of daily rail operations. ISP performance may be affected by similar operational concerns. Such changes do not necessarily reflect "inadequate" service, nor can they be effectively remedied by mandating competition. Neither the proposed transit time nor the ISP analyses provide the Board with any information about the reason for any changes in performance levels, the impact of changes on shippers, whether those changes represent a market failure requiring regulatory intervention, or whether any "inadequacies" can—or should—be addressed by mandating a competing alternative.

30. As currently written, the proposed standards offer the Board limited information relevant to the question of whether a carrier's service levels indicate a potential market failure that is appropriately remedied by mandating a reciprocal switch. They do, however, provide a starting point for analyzing service adequacy, and I focus the remainder of this report on recommended modifications to the proposed standards. Given the time allotted by the Board, I focus the bulk

of my discussion on recommended improvements to the analysis of OETA+24 (i.e., the Service Reliability standard). However, as I discuss in Section V.D, some of the methodological changes I recommend with respect to the Service Reliability standard may also be relevant to other standards the Board has proposed and may choose to adopt.

IV. MODIFICATIONS TO THE BOARD'S STANDARDS

31. The proposed Service Reliability standard includes three primary elements: the OETA+24 metric, the 12-week period of data, and the threshold for assessing whether a shipper's service on a given lane is "inadequate." I analyze each of these elements and offer modifications to each that will improve the objectivity and reliability of the proposed standard. I also recommend incorporating one additional element—a competitive benchmark—to the analysis. This addition will ensure that the Service Reliability standard offers the Board a reliable method to identify service issues that are inconsistent with the service outcomes of traffic facing competition—the appropriate benchmark if a competition-based remedy is to be triggered—and therefore may warrant additional regulatory scrutiny.

32. It is important to emphasize that this analysis is only the initial step in the regulatory review process. This method is a statistically reliable way to identify traffic that warrants closer examination, but this screen alone does not provide the Board with all of the information necessary to support a mandated reciprocal switch. Rather, more in-depth analysis is required, including providing railroads the opportunity to present evidence and raise any relevant affirmative defenses that demonstrate why there is no need for a mandated reciprocal switch.

A. REFINE THE OETA+24 METRIC

33. The Board should replace the proposed OETA+24 metric with a new metric that measures both whether a delay has occurred and the severity of delay. This can be accomplished by calculating a Service Reliability Ratio ("SRR") that expresses actual trip duration as a proportion of the original estimated acceptable service window (i.e., OETA+24, measured in minutes). Consider again Shipment A and Shipment B from paragraph 28. Both shipments move on the same lane, with the same OETA (72 hours), but Shipment A is delivered one hour after OETA+24 (a 1% delay) and Shipment B is delivered 120 hours after OETA+24 (a 125%

delay).[51] The current proposal treats both as late and offers no way to differentiate these two shipments even though the proportional delay for the two shippers is quite different. While the relative delay on a shipment is not a perfect proxy for the potential impact of delay to a shipper, it utilizes available data to measure the severity of a delay, and thus, differentiates relatively minor delays that are less likely to significantly impact the shipper from significant delays that are more likely to impact the shipper.

B. DEFINE SPECIFIC PERIODS OF ANALYSIS

34. The Board's proposal allows complaints to be based on the 12-week period of the shipper's choosing. This gives shippers the ability to search for the period most favorable to their case, even if that period does not reflect the carrier's overall performance. Because every day represents the start of a new potential 12-week period of analysis, shippers can search for a period in which a carrier fails to meet at least one of the proposed standards by carefully defining the period to include (or exclude) particularly favorable (or unfavorable) data. This could lead to mandated competition where none is necessary. For example, a shipper that experienced a short-term service issue that was quickly resolved could define a 12-week window around that issue and petition for—and potentially receive—a mandated switch based on that data, even if the issue has since been resolved and even if the carrier achieved the service standard during other differently-defined 12-week periods.

35. The Board should address this issue by defining specific periods of analysis within which shippers must demonstrate "inadequate" service. For example, if the Board wants to retain a 12-week period of analysis over which a shipper's service is assessed, it can define the 12-week periods to conform to annual quarters. A shipper would then be required to demonstrate an unresolved service inadequacy based on data from the set period (e.g., the current quarter) defined by the Board rather than over a period of the shipper's own choosing.

C. INCORPORATE A COMPETITIVE BENCHMARK

36. The Board has stated that the intent of the regulations proposed in the 2023 NPRM is to remedy inadequate service by providing shippers access to a competing carrier. As discussed above, mandating competition is a regulatory intervention that should be used only to address

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[51] The percent delay is calculated as: (Actual Trip Duration / OETA+24) - 1.

instances of market failure—where shippers can demonstrate that their outcomes are significantly different from outcomes observed in competitive markets. Yet, the proposed standards do not include any mechanisms to assess whether a carrier's performance is inconsistent with performance in competitive markets. Therefore, the proposed standards do not provide the Board with a reliable basis to conclude that a petitioner's experience is inconsistent with competitive markets or that regulatory intervention in the form of mandated competition is necessary or appropriate.

37. The Board should modify the Service Reliability standard to incorporate data on rail performance from competitive markets and use that performance as a benchmark to assess whether the service received by a complaining shipper is inconsistent with service provided in competitive markets. One reasonable candidate for a competitive benchmark in this case—where the Board has focused on non-intermodal, manifest traffic, meaning intermodal traffic does not provide a competitive benchmark as it may in other cases[52]—is shipments of exempt commodities and shipments moving in boxcars. This traffic was exempted from regulation on the basis of detailed competitive assessments demonstrating that competition for the transportation of these commodities was sufficient to discipline prices and guard against the abuse of market power.[53] In this case, a competitive benchmark would allow the Board to compare service provided to a petitioner (as measured by SRR) to the service provided to competitive shipments and determine whether the service received by the petitioner differs from the experience of competitive traffic to such a degree that further regulatory action may be appropriate. I provide more details on implementing this recommendation in Section V.

D. IDENTIFY POTENTIALLY "INADEQUATE SERVICE" USING STANDARD STATISTICAL TESTS

38. As currently written, the Service Reliability standard treats service as "inadequate" if less than 60% of shipments on a given lane are delivered within the OETA+24 service window. The Board explains the 60% on-time delivery threshold is appropriate because it is "near" four

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52 *2023 NPRM* at 16.

53 *See, e.g.,* Rail General Exemption Authority – Petition Of AAR to Exempt Rail Transportation Of Selected Commodity Groups, 9 I.C.C.2d 969 (September 17, 1993) and Surface Transportation Board, Docket No. EP 704 (Sub-No. 1) Review of Commodity, Boxcar, and TOFC/COFC Exemptions, Decision, (March 23, 2016).

carriers' average, system-wide, on-time performance for manifest traffic (as measured beginning in May 2022), which the "carriers themselves regarded as not meeting public expectations." [54]

39. The Board's desire to use available data to determine a reasonable method for identifying potential service inadequacies (i.e., instances where service is outside the bounds of normal, expected variations in competitive service to such a degree that regulatory intervention may be warranted) is reasonable and appropriate. However, adopting the carriers' average, system-wide on-time performance as a bright-line threshold against which to assess service performance on a specific lane does not achieve this goal.

40. By adopting the carriers' system-wide average as the standard of acceptable performance and declaring any failure to meet that average as unacceptable, the Board ignores that there is normal variation around all averages. For example, if the Board had considered the carriers' on-time performance at several different points in time, the carriers' average on-time performance would have shown some normal variation: in some cases the average may have been greater than 60%, in some cases it may have been lower than 60%. Choosing 60% as a bright-line threshold ignores this normal variation and treats any on-time performance below 60% as "inadequate" and thus subject to prescribed switching, even if differences from the average are minimal.

41. In fact, the on-time performance of a single carrier on a subset of shipments, such as a petitioner's traffic on a given lane, would be expected to differ from the system-wide average performance. Treating any deviation in on-time performance below the Board's 60% average as evidence of a market failure that requires regulatory intervention is far too broad. For example, a shipper may identify a group of traffic that was delivered "on time" 58% of the time. This traffic would fail the proposed screen, thus exposing the carrier to a mandated reciprocal switch, even though a deviation of this size is likely well within the expected normal variation around the system-wide average. This is especially problematic as the proposal is currently written because it allows shippers to search for any 12-week period that dips below the 60% threshold by even very small amounts.

42. One way to address this issue is to analyze the distribution of performance outcomes (as measured by SRR) across a competitive benchmark and use the SRR at the 95th percentile as a

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[54] *2023 NPRM* at 15.

threshold to identify potentially "inadequate" service. Such an approach will ensure that the analysis is identifying only service issues that are outside the bounds of normal variation and are truly different from the range of expected performance. As I discuss in Section V, where I provide more detail on how to implement this analysis, the 95th percentile is a generally accepted threshold for identifying outliers in formal statistical and economic analyses.

43. To summarize, I propose that the Board implement certain modifications to the proposed Service Reliability standard, including:

- Replace the proposed OETA+24 metric with the Service Reliability Ratio, which indicates whether a delay has occurred and provides a measure of the severity of delay;
- Define specific periods of analysis (annual quarters, for example) that eliminate the opportunity for shippers to base complaints on a particularly favorable set of data from a 12-week period of their choosing that may not reflect a carrier's general performance or an on-going service problem;
- Incorporate a competitive benchmark against which petitioners' traffic can be assessed;
- Replace the 60% threshold that is based on system-wide average performance with a statistical analysis that identifies service levels that deviate from competitive levels to such a degree that regulatory intervention may be warranted.

V. IMPLEMENTATION OF THE MODIFIED ANALYSIS

44. This section provides more detail on the implementation of each of the modifications I propose. Given the time allotted by the Board for comments, I focus my analysis and recommendations on the Service Reliability standard. However, in Section V.D, I discuss some modifications that can be applied to any of the Board's proposed standards.

A. CALCULATE SERVICE RELIABILITY RATIO

45. The first modification I propose is to replace the OETA+24 metric that measures whether a shipment is late or not with the Service Reliability Ratio ("SRR") that provides a measure of

the severity of delay. The SRR expresses delays as the ratio of actual trip duration[55] to the OETA+24 baseline and is calculated as:

$$Service\ Relaibility\ Ratio = (Total\ Trip\ Duration)/(OETA + 24\ )$$

46. Shipments arriving *at or ahead* of the OETA+24 Standard will have an SRR of 1, signifying that the shipment met the Board's criteria for on-time performance. For shipments that arrived after the OETA+24 window, the SRR will be above 1, where the amount above 1 provides a measure of the severity of delay (i.e., higher SRR indicates more severe delays) and can be interpreted as a 'percent delay.' For example, a SRR of 1.5 indicates that the actual trip duration for that shipment was 50% longer than the OETA+24 window.

B. ESTABLISH A COMPETITIVE BENCHMARK

47. The second modification I propose is to identify a set of competitive traffic that will serve as a benchmark against which the petitioner's traffic can be evaluated. As discussed in Section IV.C, because the proposed rules apply to manifest traffic, a reasonable set of benchmark traffic includes the carrier's shipments of exempt commodities (based on STCC code) and equipment types (i.e., boxcars) moving in manifest trains. In the course of a petition for reciprocal switching, the benchmark traffic will come from the same quarter as the petitioner's traffic. This will ensure that the benchmark traffic and the petitioner's traffic faced the same overall operating conditions.

48. This competitive benchmark traffic is then used to calculate a threshold SRR that identifies the upper limit of normal and expected outcomes for the SRR. Statistical analysis identifies outliers—outcomes that are outside the expected, normal range of outcomes—by studying the tails (i.e., the top and bottom parts) of a distribution. Formal statistical analyses

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[55] Total Trip Duration is based on beginning and end times as used in the OETA standard proposed by the Board. In cases where the Total Trip Duration is less than the OETA+24 standard for that shipment, the SRR is assumed to be 1, indicating it met the OETA standard for on-time performance.

typically generally define outliers as the outcomes observed in the top or bottom 5% of a distribution.[56,57]

49. Applying this rule to the distribution of SRR in the competitive benchmark traffic, one can establish the SRR at the 95th percentile of the distribution as the upper bound of expected SRR outcomes for competitive traffic. Traffic with SRR values that are lower than the threshold SRR value represent service levels that are within the normal range of expected outcomes in the set of competitive benchmark traffic. SRR values that are higher than the threshold value represent service levels that are outside the range of normal outcomes based on the competitive benchmark traffic. For example, consider a hypothetical set of benchmark traffic where the SRR value that represents the 95th percentile of the distribution is 1.30. That value then serves as the threshold SRR. SRR values below this threshold fall within the range of normal, expected on-time performance for competitive traffic. SRR values greater than this threshold represent outcomes that are outside the range of normal, expected outcomes.

50. The Board is already collecting the data necessary to implement this method. If the Board chooses to modify the proposed analysis in this way, it can require carriers to calculate and report the 95th percentile for a benchmark group of traffic every quarter.

C. EVALUATE TRAFFIC RELATIVE TO THE COMPETITIVE BENCHMARK

51. The final modification I propose is to compare the SRR of the petitioner's traffic to the competitive threshold SRR to assess whether the service received by petitioner's traffic is outside the expected outcomes for competitive traffic to such a degree that further regulatory action may be appropriate.

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[56] Under a two-tailed test the outlying 5% of the distribution would consist of the top (>97.5th percentile) plus the bottom (<2.5th percentile) outcomes. Under a one-tailed test (testing for example a null hypothesis that a mean is less than or equal to zero vs. an alternative hypothesis that the mean exceeds zero), the outlying 5% of the distribution—that would result in a rejection of the null hypothesis should the test statistic fall within that region—consists of the top portion of the distribution (>95th percentile).

[57] Sometimes economists and statisticians use lower (e.g., 1%) or higher (e.g., 10%) levels of significance. However, the 5% level of significance described here is most standard. See, e.g., James H. Stock and Mark W. Watson, *Introduction to Econometrics,* 4th edition (hereinafter "*Stock and Watson (2019*"), at 73.

52. The first step in this process is to calculate the average (mean) SRR for the lane for which the petitioner is requesting a mandated switch. That mean SRR is compared to the threshold SRR of the competitive benchmark traffic. It is important to note that, consistent with standard statistical practice, the calculation of the petitioner's mean SRR must also estimate a standard error around the mean to account for the random variation and statistical uncertainty associated with this type of time series data.[58]

53. In the present context, the comparison of the mean SRR of the petitioner's traffic against the threshold SRR obtained from the competitive benchmark allows for the formulation of a testable hypothesis: Does the mean SRR (plus/minus the standard error) of the petitioner's traffic exceed the competitive threshold SRR? A standard statistical test can be performed to formally test that hypothesis. The implementation of such a test is straightforward; it only requires computing the mean and standard deviation of the distribution of SRRs in the petitioner's traffic.[59]

54. If a petitioner's traffic does not test above the competitive benchmark SRR threshold, then there is no statistical basis to infer that the petitioner's service is outside of the normal range of expected on-time performance (when compared to the competitive benchmark) and therefore no basis to conclude that mandated competition via a reciprocal switch is necessary or remedial. If a petitioner's traffic does test above the competitive threshold SRR, then there is a statistical

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[58] *See, e.g.,* Wooldridge, Jeffrey M. (2012), *Introductory Econometrics: A Modern Approach*, 5th edition, South-Western Cengage Learning (hereinafter, "*Wooldridge (2012)*"), at 344-345 ("Formally, a sequence of random variables indexed by time is called a stochastic process or a time series process. ("Stochastic" is a synonym for random.) When we collect a time series data set, we obtain one possible outcome, or realization, of the stochastic process. We can only see a single realization because we cannot go back in time and start the process over again. (This is analogous to cross-sectional analysis where we can collect only one random sample.) However, if certain conditions in history had been different, we would generally obtain a different realization for the stochastic process, and this is why we think of time series data as the outcome of random variables. The set of all possible realizations of a time series process plays the role of the population in cross-sectional analysis. The sample size for a time series data set is the number of time periods over which we observe the variables of interest").

[59] For detailed discussion of the hypothesis testing concepts described here. *See, e.g., Wooldridge (2012)*, at 780-784. When the summary statistic used is the mean and the sample is sufficiently large (typically a sample size of 30 or more), a standard statistical result known as the Central Limit Theorem ensures that the test statistic follows the standard normal distribution, regardless of the shape of the underlying distribution. In other words, the test can be implemented even if the measure of interest (the shipper's SRR) is not normally distributed. (*See, Stock and Watson (2019)*, at 47.)

basis to conclude that the on-time performance reflected in petitioner's traffic is different from a normal range of on-time performance reflected in the benchmark traffic and would merit further consideration.

D. APPLICATION TO ADDITIONAL STANDARDS

55. Even if the Board decides to implement the proposed standards without any modifications, standard statistical tests should be incorporated into the Board's analysis to determine whether the petitioner's traffic meets the Board's standards. For example, if the Board chooses to move forward with the Service Consistency standard, which compares year-over-year changes in average transit time, it is appropriate and necessary to incorporate a statistical test to ensure that any observed increase in average transit time from one year to the next represents an actual increase in average time, rather than just the normal and expected variation in the means of different datasets observed across different periods.

56. More specifically, with respect to the proposed transit time analysis, the Board proposes a test to determine whether the difference in average transit time is less than 20%. This hypothesis can be tested statistically. For example, a so-called *t test* can be employed where the tested null hypothesis is that the difference in mean transit times between the two periods is less than or equal to 20%. Only if this null hypothesis is rejected statistically—after accounting for statistical uncertainty—would there be statistical basis for inferring that the increase in the transit time for the petitioner's traffic exceeds 20% (as opposed to merely reflecting random fluctuations).

E. AFFIRMATIVE DEFENSES

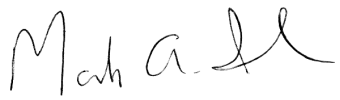
57. It is important to stress that a finding that a given petitioner's SRR lies outside the bounds of expected variation in competitive markets is not sufficient support for a prescribed reciprocal switch. As the Board notes in the 2023 NPRM, the carriers must have the opportunity to present evidence and raise any relevant affirmative defenses explaining why a reciprocal switch is not warranted.

VI. CONCLUSION

58. The Board's effort to design an objective and data-driven approach to assessing service quality is commendable. The modifications I propose will allow the Board to use the data it is

already collecting in an analytically sound way that achieves its stated intention of adopting a reliable objective standard and transparent method to identify instances where unregulated market outcomes are inconsistent with competition, thus warranting further consideration of whether regulatory intervention is necessary.

I declare the forgoing to be true and correct.



Mark A. Israel
November 6, 2023

EXHIBIT A

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- Particular expertise in industries including: Wireline and wireless telecommunications, media, advertising, sports, airlines, railroads, and other transportation services.
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- Selected case highlights: CCB v. Rogers/Shaw; NFL Sunday Ticket Antitrust Litigation; DOJ v. Google Search Litigation; DOJ v. AA/JetBlue JV; PGA Tour v. LIV Golf; Viamedia v. Comcast; Capacitors Price Fixing Jury Trial; Rail Fuel Surcharge Litigation; Verizon-Tracfone Hearings; Sprint-T-Mobile Hearings; DOJ v. AT&T/Time Warner; AA-US Airways Merger; Comcast-NBCU Merger; DOJ Oneworld Airline Alliance Investigation.
- Research published in leading scholarly and applied journals including *The American Economic Review*, *The Rand Journal of Economics*, A*ntirust Law Journal, The Journal of Competition Law and Economics, and The Review of Network Economics.*
- Co-author of the chapter on Econometrics and Regression Analysis in the ABA Treatise, *Proving Economic Damages: Legal and Economic Issues,* 2017.

EDUCATION

- Ph.D., Economics, STANFORD UNIVERSITY, June 2001.
- M.S., Economics, UNIVERSITY OF WISCONSIN-MADISON, August 1992.
- B.A., Economics, ILLINOIS WESLEYAN UNIVERSITY, Summa Cum Laude, May 1991.

EMPLOYMENT HISTORY

Compass Lexecon: *Senior Managing Director and Member of Four-Person Global Executive Committee*.

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Kellogg School of Management, Northwestern University: *Assistant Professor of Management and Strategy*, 2000 – 2006; *Associate Professor of Management and Strategy*, 2007 – 2008.

State Farm Insurance: *Research Administrator*, 1992 – 1995.

RECENT PROFESSIONAL RECOGNITIONS

Global Competition Review, Economist of the Year, 2023.

Global Competition Review Who's Who Legal, Global Elite Thought Leader: 2022, 2023.

Global Competition Review Who's Who Legal, Thought Leader in USA Competition, 2024.

Global Competition Review Who's Who Legal, Thought Leader in Competition: 2019, 2020, 2022, 2023.

LIVE TESTIMONIAL EXPERIENCE

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Testimony as Economic Expert on behalf of Verra Mobility Corp., In the Matter of *Pluspass, Inc. v. Verra Mobility Corp., et al.*, In the United States District Court Central District of California – Western Division, No. 2:20-cv-10078-FWS-SK, Deposition: May 24, 2023.

Testimony as Economic Expert on behalf of United Chemi-Con, In the Matter of *Avnet Incorporated v. Hitachi Chemical Company* (*In Re Capacitors Antitrust Litigation*, No. 17-mdl-2801-JD), United States District Court Northern District of California, No. 17-cv-7046-JD, Live Trial Testimony: May 18, 2023.

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Testimony as Economic Expert on behalf of Google, LLC, In the Matter of *United States of America, et al. v. Google LLC* (Case No. 1:20-cv-03010-APM), and *State of Colorado, et al. v. Google LLC* (Case No. 1-20-cv-03715-APM), In the United States District Court for the District of Columbia, Deposition: November 3, 2022; November 4, 2022.

Testimony as Economic Expert on behalf of American Airlines, Inc., In the Matter of *United States of America, et al. v. American Airlines Group Inc. and JetBlue Airways Corporation*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:21-cv-11558-LTS, Deposition: August 22, 2022; Live Trial Testimony: October 17, 2022; October 24, 2022.

Testimony as Economic Expert on behalf of Comcast Corporation, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Spotlight, LP*, In the United States District Court Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Deposition: January 5, 2018; October 21, 2022.

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Testimony as Economic Expert on behalf of Arconic, Inc., et al., In the Matter of *Arconic, Corp., and Howmet Aerospace, Inc. v. Novelis, Inc., and Novelis, Corp.,* United States District Court for the Western District of Pennsylvania, Case No. 2:17-cv-014340-JFC, Deposition: April 29, 2022.

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Testimony as Economic Expert on behalf of American Express, In the Matter of *B & R Supermarket, Inc., d/b/a Milam's Market, et al., Individually and on Behalf of All Others Similarly Situated v. Visa, Inc., et al.,* In the United States District Court Eastern District of New York, Case No. 117-cv-02738-MKB-VMS, Deposition: August 6, 2021.

Testimony as Economic Expert on behalf of Bio-Rad Laboratories, Inc., In the Matter of *Bio-Rad Laboratories, Inc. and President and Fellow of Harvard College v. 10X Genomics, Inc., and 10X Genomics, Inc. v. Bio-Rad Labs, Inc. and President and Fellow of Harvard College as Counterclaimants,* In the United States District Court for the District of Massachusetts, Civil Action No. 1:19-cv-12533-wgy, Deposition: June 1, 2021.

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Testimony as Economic Expert on behalf of Peabody Energy Corporation and Arch Coal, Inc., In the Matter of *Federal Trade Commission v. Peabody Energy Corporation and Arch Coal, Inc.*, In the United States District Court for the Eastern District of Missouri, Civil Action No. 4-20-cv-000317-SEP, Deposition: June 29, 2020; Live Trial Testimony: July 24, 2020.

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Appearances in Federal Communications Commission, Economists Panels:

- Comcast/Time Warner, January 2015
- AT&T/T-Mobile, July 2011
- Comcast/NBCUniversal, August 2010

Appearance before California Public Utility Commission, Public Hearings on Comcast/Time Warner Merger, Los Angeles, April 2015.

Appearance as Economic Expert in front of Department of Justice, Federal Trade Commission, Federal Communications Commission, and State Regulatory Agencies in many additional transactions, including: Danaher/NetScout, AT&T/Leap Wireless, T-Mobile/MetroPCS, American Airlines/US Airways, SpectrumCo/Cox/Verizon Wireless, oneworld antitrust immunity application, PepsiCo/bottlers, Houghton Mifflin/Harcourt, Chicago Mercantile Exchange/Chicago Board of Trade.

EXPERT REPORTS, AFFIDAVITS, AND DECLARATIONS

Expert Report of Mark A. Israel, Ph.D., In the Matter of *Federal Trade Commission v. IQVIA Holdings Inc. and Propel Media, Inc.*, In the United States District Court for the Southern District of New York, Civil Action No. 1:23-cv-06188-ER, October 25, 2023.

Expert Report of Mark A. Israel, In the Matter of *Commonwealth of Virginia, Ex. rel. and Joshua M. Harman v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Court of Circuit Court for the City of Richmond, Case No. CL 13-698, October 12, 2023.

Expert Report of Mark A. Israel, Ph.D., *In Re Automatic Card Shufflers Litigation*, In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 1:21-CV-01798, August 20, 2023.

Expert Report of Mark A. Israel, Ph.D., *In Re Rail Freight Fuel Surcharge Antitrust Litigation (No. II)*, In the United States District Court for the District of Columbia, MDL Docket No. 2925, Misc. No. 20-8 (BAH), August 15, 2023.

Expert Reports of Mark A. Israel, Ph.D., In the Matter of *City of Rockford, on behalf of itself and all others similarly situated v. Mallinckrodt ARD, Inc. formerly known as Questcor Pharmaceuticals, Inc., et al.*, In the United States District Court for the Northern District of Illinois Western Division, Case No. 3:17-cv-50107, Initial Report: October 17, 2022; Reply Report: July 10, 2023.

Report of Dr. Mark A. Israel, In the Matter between *Topher's Beard Company and Olin Corporation, et al.*, Canadian Federal Court Proposed Class Proceeding, Court File No.: T-1365-20, May 23, 2023.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *Pluspass, Inc. v. Verra Mobility Corp., et al.*, In the United States District Court Central District of California – Western Division, No. 2:20-cv-10078-FWS-SK, May 10, 2023.

Declarations of Mark A. Israel on behalf of AT&T, Application of Pacific Bell Telephone Company d/b/a AT&T California (U 1001 C) for Targeted Relief from Its Carrier of Last Resort Obligation and Certain Associated Tariff Obligations, Before the Public Utilities Commission of the State of California, A.23-03-003, Declaration: March 3, 2023; Reply Declaration: April 17, 2023; Amended Declaration: May 17, 2023.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *TCS John Huxley America, Inc.; TCS John Huxley Europe Limited; TCS John Huxley Asia Limited; and Taiwan Fulgent Enterprise Co., Ltd. Vs. Scientific Games Corporation; Bally Technologies, Inc., d/b/a SHFL Entertainment or Shuffle Master; and Bally Gaming, Inc., d/b/a Bally Technologies, f/k/a Bally Gaming and Systems, f/k/aa SHFL Entertainment, Inc., f/k/a Shuffle Master, Inc.,* In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 1:19-CV-01846, April 14, 2023.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *Home Depot U.S.A., Inc. v. Lafarge North America Inc.*, In the United States District Court Eastern District of Pennsylvania, Case No. 2:18-cv-05305-MMB, March 21, 2023.

Expert Report of Mark A. Israel, Ph.D., *In Re National Football League Sunday Ticket Antitrust Litigation*, In the United States District Court Central District of California, Case No. ML 15-02668-PSG (JEMx), November 4, 2022.

Expert Reports of Mark A. Israel, In the Matter of the *Competition Act*, R.S.C. 1985, c. C-34; and In the Matter of the proposed acquisition by Rogers Communications Inc. of Shaw Communications Inc.; and In the Matter of an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act,* Between Commissioner of Competition and Rogers Communications Inc. and Shaw Communications Inc. and the Attorney General of Alberta and Videotron Ltd., the Competition Tribunal, CT-2022-002, Initial Report: September 23, 2022; Reply Report: October 20, 2022.

Expert Reports of Mark A. Israel, In the Matters of *United States of America, et al. v. Google LLC* (Case No. 1:20-cv-03010-APM), and *State of Colorado, et al. v. Google LLC* (Case No. 1-20-cv-03715-APM), In the United States District Court for the District of Columbia, Initial Report: June 4, 2022; Rebuttal Report: August 5, 2022; Reply Report: September 23, 2022.

Reports of Dr. Mark A. Israel, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Cable Communications Management, LLC*, In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Rebuttal Report: November 30, 2017; Errata Sheet for Rebuttal Report: January 4, 2018; Rebuttal Report: September 21, 2022.

Expert Declaration of Mark Israel, In the Matter of *Phil Mickelson, et al. v. PGA Tour, Inc.*, In the United States District Court for the Northern District of California San Jose Division, Civil Action No. 5:22-cv-04486-BLF, August 7, 2022.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *United States of America, et al. v. American Airlines Group Inc. and JetBlue Airways Corporation*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:21-cv-11558-LTS, July 11, 2022.

Expert Reports of Mark A. Israel, Ph.D., *In Re Rail Freight Fuel Surcharge Antitrust Litigation*, In the United States District Court for the District of Columbia, MDL No. 1869, Case No. 07-489, Initial Report: April 15, 2021; Surrebuttal Report: May 10, 2022.

Expert Reports of Mark A. Israel, Ph.D., In the Matter of *Arconic Inc. v. Novelis Inc., Novelis Corp.*, In the United States District Court for the Western District of Pennsylvania, No. 2:17-CV-01434, Initial Report: February 11, 2022; Reply Report: March 18, 2022.

Verified Statement of Mark A. Israel, Ph.D., "Reciprocal Switching," Surface Transportation Board, Docket No. EP 711 (Sub-No. 1), February 14, 2022.

Expert Report of Mark A. Israel, In the Matter between *Sean Allott and Panasonic Corporation, et al.,* In the Ontario Superior Court of Justice, Court File No. 1899-2015 CP, January 17, 2022.

Expert Reports of Mark A. Israel, Ph.D., *In Re Aluminum Warehousing Antitrust Litigation*, In the United States District Court Southern District of New York, MDL No. 2481, Initial Report: September 17, 2021; Supplemental Declaration: January 14, 2022.

Expert Report of Mark Israel, In the Matter of *Chase Manufacturing, Inc. d/b/a Thermal Pipe Shields v. Johns Manville Corporation*, In the United States District Court for the District of Colorado, Civil Action No. 1:19-cv-00872-MEH, November 20, 2021.

Affidavits in confidential arbitration regarding wholesale roaming rate for wireless telecommunications, Initial Affidavit: August 23, 2021; Reply Affidavit: November 15, 2021.

Expert Report of Mark A. Israel, In the Matter of *Bio-Rad Laboratories, Inc. and President and Fellow of Harvard College v. 10X Genomics, Inc., and 10X Genomics, Inc. v. Bio-Rad Labs., Inc. and President and Fellow of Harvard College as Counterclaimants*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:19-cv-12533-wgy, May 14, 2021.

Expert Report of Mark A. Israel, In the Matter of *B & R Supermarket, Inc., d/b/a Milam's Market, Grove Liquors LLC, Strouk Group LLC, d/b/a Monsieur Marcel, and Palero Food Corp. and Cagueyes Food Corp., d/b/a Fine Fare Supermarket v. Mastercard International Inc., Visa Inc., Visa U.S.A., Inc., Discover Financial Services, and American Express Company*, In the United States District Court for the Eastern District of New York, Case No. 17-CV-02738 (MKB) (JO), March 22, 2021.

Expert Report of Dr. Mark A. Israel, In the Matter of *Joshua M. Harman Qui Tam v. Trinity Industries, Inc., et al.,* In the Commonwealth of Massachusetts, Superior Court Department, Civil Action No. 2014-02364-D, February 26, 2021.

Verified Statement of Mark Israel, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), January 29, 2021.

Expert Report of Mark A. Israel, Ph.D., *In Re Comtech/Gilat Merger Litigation*, Court of Chancery of the State of Delaware, Consolidated C.A. No. 2020-0605-JRS, September 24, 2020.

Declaration of Mark Israel and Allan Shampine, In the Matter of *AMC Networks Inc. v. AT&T Inc.*, Before the Federal Communications Commission, MB Docket No. 20-254, File No. CSR-8993, August 20, 2020.

Expert Report of Mark A. Israel, In the Matter between *Ryan Kett and Mitsubishi Materials Corporation, Mitsubishi Cable Industries, Ltd., Mitsubishi Shindoh Co., Ltd., Mitsubishi Aluminum Co., Ltd., Tachibana Metal Mfg. Co., Ltd., and Diamet Corporation,* In the Supreme Court of British Columbia, Case No. VLC-S-S-1813758, July 15, 2020.

Expert Reports of Mark A. Israel, Ph.D., In the Matter of *Federal Trade Commission v. Peabody Energy Corporation and Arch Coal, Inc.*, In the United States District Court for the Eastern District of Missouri, Civil Action No. 4-20-cv-000317-SEP, Initial Report: May 26, 2020; Reply Report: June 19, 2020.

Expert Reports of Mark A. Israel, Ph.D., *In Re Dealer Management Systems Antitrust Litigation*, United States District Court for the Northern District of Illinois Eastern Division, MDL 2817, No. 1:18-CV-864, Initial Report: August 26, 2019; Reply Report: December 19, 2019.

Expert Reports of Mark A. Israel, Ph.D., *In Re Domestic Airline Travel Antitrust Litigation*, United States District Court for the District of Columbia, MDL Docket No. 2656, Misc. No. 15-1404 (CKK), Initial Report: September 30, 2019; Rebuttal Report: November 14, 2019.

Expert Reports of Mark A. Israel, In the Matter of *DISH Network L.L.C. v. Turner Network Sales, Inc.*, JAMS Arbitration No. 1100103066, Initial Report: July 23, 2019; Reply Report: August 2, 2019.

Submission of Mark A. Israel, Maya Meidan, and Robert J. Calzaretta, Jr., "The Atlantic Joint Business Generates Substantial Consumer Benefits," Competition and Markets Authority, United Kingdom, July 1, 2019.

Submission of Philip Haile and Mark Israel, "Alternative Approaches to Airport Slot Allocation: Objectives and Challenges," Department for Transport, United Kingdom, June 20, 2019.

Submission of Mark A. Israel, Maya Meidan, and Robert J. Calzaretta, Jr., "The Atlantic Joint Business Has Not Harmed Competition on Nonstop Overlap Routes, Including Focus Routes," Competition and Markets Authority, United Kingdom, June 14, 2019.

Expert Reports of Mark A. Israel, In the Matter of *RCHFU, LLC, et al. v. Marriott Vacations Worldwide Corporation, et al.,* In the United States District Court for the District of Colorado, Civil Action No. 16-01301-PAB-GPG, Initial Report: December 28, 2018; Supplemental Rebuttal Report, June 14, 2019.

Submission of Mark Israel, "The Fidelity/Stewart Merger Does Not Raise Competitive Concerns in the New York Title Insurance Industry," Revised Section 1506 Application Regarding the Proposed Acquisition of Stewart Title Insurance Company by Fidelity National Financial, Inc., New York State Department of Financial Services, April 12, 2019.

Second Report of Dr. Mark A. Israel, Between *UK Trucks Claim Limited and (1) – (5) Fiat Chrysler Automobiles NV and (1) – (4) MAN Truck & Bus AG & ORS*, In the Competition Appeal Tribunal, Case No. 1282/7/7/18, April 11, 2019.

Expert Report of Mark A. Israel, In the Matter between *Ryan Kett, Erik Oun and Jim Wong and Kobe Steel, Ltd., Shinko Metal Products Co., Ltd., Shinko Aluminum Wire Co., Ltd., Shinko Wire Stainless Company, Ltd., Kobelco & Materials Copper Tube Co., and Nippon Koshuha Steel Co., Ltd.*, In the Supreme Court of British Columbia, Case No. S-1710805, March 28, 2019.

Expert Report of Dr. Mark A. Israel, Between *Road Haulage Association and (1) – (10) MAN SE and Others and (1) Daimler AG, (2) Volvo Lastvagnar Aktiebolag*, In the Competition Appeal Tribunal, Case No. 1289/7/7/18, March 22, 2019.

Submission of Robert J. Calzaretta, Jr., Mark A. Israel, and Maya Meidan, "Assessing the Effects of ATI and JV Overlaps on Nonstop Fares: An Event Study Approach," submitted as part of a Supplement to Joint Motion to Amend Order 2010-7-8 for Approval of and Antitrust Immunity for Amended Joint Business Agreement, In the Application of American Airlines, Inc., British Airways PLC, OpenSkies SAS, Iberia Líneas Aéreas de España, S.A., Finnair OYJ, Aer Lingus Group DAC, Before the U.S. Department of Transportation, Washington, DC, Docket DOT-OST-2008-0252-, January 11, 2019.

Declarations of Mark A. Israel, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a Florida Blue; Health Options Inc., d/b/a Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a Florida Health Care Plans,* In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Declaration: November 19, 2018; Supplemental Declaration: December 21, 2018.

Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating, In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation, Consolidated Applications for Consent to Transfer Control of Licenses and Authorizations, Federal Communications Commission, WT Docket No. 18-197, September 17, 2018.

Expert Report of Gustavo Bamberger, Robert Calzaretta, and Mark Israel, In the Joint Application of Hawaiian Airlines, Inc. and Japan Airlines, Co., Ltd., Appendix 6 to "Joint Application for Approval of and Antitrust Immunity for Alliance Agreements," Department of Transportation, Case No. DOT-OST-2018-0084, June 13, 2018.

Expert Reports of Mark A. Israel, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation, et al.,* In the Ontario Superior Court of Justice, Court File No. 3795/14CP, Initial Report: November 17, 2017; Reply Report: February 23, 2018; Supplemental Report: May 22, 2018.

Expert Report of Mark A. Israel, In the Matter of the *Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA Wilhelmsen Maritime Services As Resolute Fund II, L.P. Drew Marine Intermediate II B.V. and Drew Marine Group, Inc.*, In the United States District Court for the District of Columbia, No. 1:18-cv-00414-TSC, May 11, 2018.

Declaration of Mark A. Israel, In the Matter between *Robert Foster and Murray Davenport and Sears Canada Inc., et al.*, In the Ontario Superior Court of Justice, Court File No. 766-2010 CP, November 1, 2017.

Expert Report of Mark Israel and Bryan Keating, "Economic Analysis of Dr. Evans' Claims as They Relate to *Restoring Internet Freedom*," Federal Communications Commission, WC Docket No. 17-108, October 31, 2017.

Written Rebuttal Testimony of Dr. Mark A. Israel, In the Matter of *Distribution of Cable Royalty Funds*, Before the Copyright Royalty Judges, Washington, D.C., No. 14-CRB-0010-CD, September 15, 2017; Written Direct Testimony: December 22, 2016.

Declaration of Mark A. Israel, Allan L. Shampine, and Thomas A. Stemwedel, In the Matter of *Restoring Internet Freedom*, Federal Communications Commission, WC Docket No. 17-108, July 17, 2017.

Expert Report of Dr. Mark A. Israel, In the Matter of *St. Clair County, Illinois, and Macon County, Illinois, Individually and on behalf of all other counties in the State of Illinois, v. Trinity Industries, Inc. and Trinity Highway Products, LLC*, In the United States District Court for the Southern District of Illinois, Civil Action No.: 3:14-cv-1320, April 25, 2017.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Initial Report: March 27, 2017; Rebuttal Report: April 10, 2017.

Expert Report of Mark A. Israel, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, March 24, 2017.

Expert Report of Mark A. Israel, In the Matter of *Honeywell International Inc. v. iControl Networks, Inc. and Alarm.com Holdings, Inc.*, In the United States District Court for the District of New Jersey, No. 2:17-cv-01227, February 26, 2017.

Expert Report of Mark Israel, In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the United States District Court for the District of Delaware, C.A. No. 14-1525-LPS, November 23, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and DENSO Corporation, et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-135610, November 15, 2016.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America, et al. v. Anthem Inc. and Cigna Corp.*, In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), Initial Report: October 7, 2016; Supplemental and Rebuttal Report: October 28,2016.

Verified Statements of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), Initial Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, Second Declaration: June 28, 2016; Third Declaration: August 9, 2016.

Expert Declaration of Mark A. Israel, In the Matter of *Liberman Broadcasting, Inc. and LBI Media, Inc. v. Comcast Corporation and Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 16-121, June 7, 2016.

Expert Report of Mark A. Israel, In the Matter of *La Crosse County, Individually, and on behalf of all others similarly situated v. Trinity Industries, INC. and Trinity Highway Products, LLC*, In the United States District Court, Western District of Wisconsin, Case No. 3:15-cv-00117-scl, May 27, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and Nippon Yusen Kabushiki Kaisha, et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-134895, May 20, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of *Special Access Rates for Price Cap Local Exchange Carriers*, Federal Communications Commission, WC Docket No. 05-25, Declaration: February 19, 2016; Supplemental Declaration: March 24, 2016; Second Supplemental Declaration: April 20, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Competitive Analysis of the FCC's Special Access Data Collection," Federal Communications Commission, WC Docket No. 05-25, January 26, 2016.

Declaration of Dr. Mark Israel, In the Matter of *iPic – Gold Class Entertainment, LLC, et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al.*, In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, January 18, 2016.

Declaration of Dennis Carlton, Mark Israel, Allan Shampine & Hal Sider, "Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans," Federal Communications Commission, WC Docket No. 15-247, January 7, 2016.

Declaration of Mark A. Israel, Attached to "Response of AT&T Mobility LLC to Notice of Apparent Liability for Forfeiture," Federal Communications Commission, File No. EB-IHD-14-00017504, July 17, 2015.

Reports in the Matter of *Federal Trade Commission, et al. v. Sysco Corporation and USF Holding Corp.*, In the United States District Court for the District of Columbia, Civil Action No. 1:15-cv-00256 (APM), Declaration: February 18, 2015; Report: April 14, 2015; Rebuttal Report: April 21, 2015.

Declaration of Mark A. Israel, Bryan G. M. Keating, and David Weiskopf, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Voice and Broadband Services in California," December 3, 2014.

Expert Report of Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Federal Communications Commission, MB Docket No. 14-57, September 22, 2014.

Supplemental Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix A to "Reply Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, July 24, 2014.

Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix B to "Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, June 26, 2014.

Expert Report of Mark A. Israel, "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Federal Communications Commission, MB Docket No. 14-57, April 8, 2014.

Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Sprint's Proposed Weighted Spectrum Screen Defies Economic Logic and Is Inconsistent with Established Facts," Federal Communications Commission, WT Docket No. 12-269, March 14, 2014.

Reply Declaration of Mark A. Israel, "Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T: A Reply Declaration," Federal Communications Commission, WT Docket No. 13-193, October 23, 2013.

Declaration of Mark A. Israel, "An Economic Analysis of Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T," Federal Communications Commission, WT Docket No. 13-193, August 1, 2013.

Supplemental Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comments on Appropriate Spectrum Aggregation Policy with Application to the Upcoming 600 MHz Auction," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

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Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding Credits, and Unlicensed Spectrum," Federal Communications Commission, GN Docket No. 12-268, March 12, 2013.

Declaration of Igal Hendel and Mark A. Israel, "Econometric Principles That Should Guide the Commission's Analysis of Competition for Special Access Service," Federal Communications Commission, WC Docket No. 05-25, February 11, 2013.

Declarations of Mark A. Israel and Michael L. Katz, "Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings," Federal Communications Commission, WT Docket No. 12-269, Declaration: November 28, 2012; Reply Declaration: January 7, 2013.

Declaration of Mark Israel, "An Economic Assessment of the Prohibition on Exclusive Contracts for Satellite-Delivered, Cable-Affiliated Networks," Federal Communications Commission, MB Docket Nos. 12-68, 07-18, & 05-192, September 6, 2012.

Expert Report of Mark Israel, "Implications of the Verizon Wireless & SpectrumCo/Cox Commercial Agreements for Backhaul and Wi-Fi Services Competition," Federal Communications Commission, WT Docket No. 12-4, August 1, 2012.

Expert Report of Mark A. Israel, Michael L. Katz, and Allan L. Shampine, "Promoting Interoperability in the 700 MHz Commercial Spectrum," Federal Communications Commission, WT Docket No. 12-69, July 16, 2012.

Affidavits of Dr. Mark A. Israel in the Matter of *Bloomberg L.P. v. Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 11-104, Declaration: June 21, 2012; Declaration: June 8, 2012; Supplemental Declaration: September 27, 2011; Declaration: July 27, 2011.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Response to Supplementary Comments of Hubert Horan," Docket DOT-OST-2009-1055, October 22, 2010.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Docket DOT-OST-2009-1055, October 13, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Economic Analysis of the Proposed Comcast-NBCU-GE Transaction," Federal Communications Commission, MB Docket No. 10-56, July 20, 2010.

Expert Report of Mark Israel and Michael L. Katz, "The Comcast/NBCU Transaction and Online Video Distribution," Federal Communications Commission, MB Docket No. 10-56, May 4, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Application of the Commission Staff Model of Vertical Foreclosure to the Proposed Comcast-NBCU Transaction," Federal Communications Commission, MB Docket No. 10-56, February 26, 2010.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity: Response of Robert Willig, Mark Israel, and Bryan Keating" in Docket DOT-OST-2008-0252, January 11, 2010.

Affidavit of Dr. Mark A. Israel on Class Certification in the Matter of Puerto Rican Cabotage Antitrust Litigation, in the United States District Court for the District of Puerto Rico, MDL Docket No. 3:08-md-1960 (DRD), December 10, 2009.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity," Docket DOT-OST-2008-0252, September 8, 2009.

Expert Report and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in the Matter of *Toys "R" Us-Delaware, Inc., and Geoffrey Inc. v. Chase Bank USA N.A.*, in American Arbitration Association New York, New York, Commercial Arbitrations No. 13-148-02432-08, Expert Report: February 27, 2009; Supplemental Expert Report: March 20, 2009.

Expert Reports of James Levinsohn and Mark Israel, In the Matter of *2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement*, October 6, 2008; January 16, 2009; March 10, 2009.

SELECTED OTHER EXPERT WORK IN REVIEW OF MERGERS/TRANSACTIONS

Successful acquisition of NWEA by Houghton Mifflin Harcourt, 2023. Served as lead economic expert for Veritas Capital, owner of Houghton Mifflin Harcourt. Provided analyses demonstrating no significant competitive overlaps, no significant vertical concerns, and substantial pro-competitive benefits via integration of curriculum materials and assessment tools. Deal cleared by DOJ without a second request.

Successful merger of Sony's Cruncyhroll and AT&T's Funimation anime streaming platforms. 2021. Served as lead economic expert for AT&T. Made multiple presentations to DOJ, demonstrating lack of significant competitive interaction between the parties, including extremely limited consumer switching between them, as well as extensive competition with a broader marketplace including Netflix, Amazon, and others. DOJ closed the investigation allowing the merger to proceed with no conditions.

Successful acquisition of Innovative Industries, Inc. by Ex Libris. 2020. Served as lead economist in interactions with FTC. Demonstrated that the acquisition would not harm competition due to the *de minimis* extent of head-to-head competition between Ex Libris and Innovative and the recent decline of Innovative' s business. FTC closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of TD Ameritrade by Charles Schwab. 2020. Served as lead economist in interactions with DOJ. Presented analyses demonstrating broad market for investor dollars rather than narrow market for RIA Custodian Services. DOJ closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of Reinhart Foodservice by Performance Food Group Company. 2019. Served as lead economic expert on behalf of the parties in the FTC's investigation of the merger. Presented data analyses showing ample competition and lack of harm to competition in any geographic market. FTC closed the investigation with no conditions.

Successful acquisition of SGA's Food Group of companies by US Foods. 2019. Served as lead economic expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed economics and econometric analyses showing ample competition and lack of harm to competition in any geographic market. FTC cleared the merger subject to divestitures in three geographic markets in the Fall of 2019.

Successful acquisition of Time Warner by AT&T Inc. 2017-2019. Lead economist throughout the DOJ investigation. Then director of all economic work during trial, serving as the central connection point between all experts and counsel and directing development of all aspects of the economic case. Defendants ultimately prevailed in trial and the merger closed in June 2018.

Successful acquisition of Keystone Foods by Tyson Foods, Inc. 2018. Served as lead economic expert for U.S. jurisdiction. Presented economic analyses demonstrating that competition would remain strong post-merger. Ultimately, antitrust agencies in the U.S., China, Japan, and Korea cleared the transaction.

Successful acquisition of NEX Group PLC by CME Group Inc. 2018. Co-lead economic expert with Thomas Stemwedel. Presented several econometric analyses demonstrating that Treasury futures contracts and cash Treasury securities were economic complements rather than substitutes. Based heavily on these Compass Lexecon submissions, the DOJ and CMA closed their investigations without requiring any divestitures.

Successful acquisition of VCA Inc. by Mars, Inc. 2017. Co-lead economic expert with Mary Coleman. Made multiple presentations to FTC demonstrating ample competition in general, emergency, and specialty veterinary services, including econometric analyses showing lack of direct competitive impact of Mars and VCA on one another. Transaction was ultimately cleared subject to a small number of divestitures.

Successful acquisition of Mobileye by Intel. 2017. Served as lead economic expert for Intel. Assisted counsel in preparing FTC presentations and materials demonstrating lack of significant head-to-head competition and lack of valid vertical foreclosure theories. Investigation was closed without Second Request.

FTC litigation against DraftKings, Inc. and FanDuel Inc. (Civil Action No. 17-cv-1195 (KBJ)). 2017. Served as economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to the parties' abandonment of the deal. Developed economic and econometric evidence that the merging parties were closest substitutes and thus likely would have increased prices as a result of their proposed merger.

Successful merger of ASE Group and SPIL. 2017. Lead economic expert on behalf of ASE Group. Submitted reports and testified to the Taiwan Fair Trade Commission, which ultimately cleared the transaction, then made multiple presentations to U.S. FTC, which also cleared the transaction. Economic analyses focused on implications of profit margins for market definition and competitive effects, ultimately demonstrating that the transaction was unlikely to cause significant harm to competition.

Successful acquisition of Alarm.com of two business units (Connect and Piper) from iControl Networks. 2017. Led team that demonstrated substantial and growing competition in home security and connected home marketplace and thus lack of competitive harm from acquisition. Work focused on importance of downstream market definition as well as empirical evidence of impact of competition on Alarm.com pricing and profitability.

Successful acquisition of Samsung Electronics, Ltd.'s printer business by HP Inc. 2016. Led team in evaluating the competitive effects of the acquisition, including assessing shares and competitive effects in overlap areas. Notably, the transaction gained regulatory approval in the U.S. during the initial review period without issuing a Second Request.

Successful acquisition of Sun Products Corp. by Henkel AG. 2016. Led team demonstrating lack of competitive impact despite overlaps in laundry detergent and related products.

Successful acquisition of Starwood Hotels & Resorts by Marriott International. 2016. Led team that performed detailed analysis of competitive conditions, extensive econometric analysis of pricing, and full review of Marriott's internal pricing models to demonstrate that Starwood and Marriott were not close competitors, combined ownership of the brands would not lead to upward pricing pressure, and competition would remain robust post-merger.

Successful acquisition of PR Newswire by GTCR. 2016. Lead economic expert for GTCR. Made presentations to DOJ showing lack of competitive harm from the transaction, based on detailed analysis of win/loss data, including calculations showing no possible upward pricing pressure (UPP) concerns regardless of the level of margins.

Successful acquisition of Schurz Communications' Broadcast Stations by Gray Television. 2015. Lead economic expert for Gray. Made presentations to DOJ demonstrating output expanding effects of proposed transaction in light of the scale economies in television production and advertising and the small size of the DMAs affected by the transaction.

Successful acquisition of the Communications Business of Danaher Corporation by NetScout Systems. 2015. Lead economic expert for NetScout. Made presentations to DOJ describing proper economic framework for analysis of competition and potential merger harms, and demonstrated that the presence of multiple viable competitors and numerous other credible threats to be used by powerful buyers in a dynamic industry made theories of anti-competitive harm from the merger implausible.

Successful acquisition of Windmill Distribution Co. by Manhattan Beer Distributors. 2015. Lead economic expert for Manhattan Beer Distributors. Submitted White Paper to DOJ demonstrating, based on margin data, that the merger would be highly unlikely to lead to anti-competitive effects. Transaction was granted early termination from the Hart Scott Rodino process by the DOJ.

Proposed acquisition of Time Warner Cable by Comcast Corporation. 2014-2015. Served as lead economic expert on broadband issues on behalf of Comcast Corporation. Submitted multiple Declarations and made multiple presentations to DOJ and FCC, explaining lack of horizontal, bargaining, or vertical/foreclosure concerns with regard to broadband competition as a result of the transaction.

Successful acquisition of Leap Wireless by AT&T. 2014. Lead economic expert for AT&T. Submitted multiple Declarations to FCC and made presentation to DOJ, demonstrating the transaction would generate substantial consumer benefits, while generating at most minimal upward pricing pressure in a properly defined mobile wireless services market and no issues related to spectrum concentration or other competitive concerns.

Successful merger of American Airline and US Airways. 2013. Lead consulting expert, managing Compass Lexecon team of over 25 economists supporting multiple experts. Made multiple presentations to DOJ, worked on expert reports in litigation, and assisted counsel with the analysis leading to settlement of litigation, permitting transaction to close.

Successful merger of T-Mobile USA and MetroPCS. 2013. Lead economic expert for T-Mobile USA. Conducted economic analyses of competitive effects and consumer benefits from the transaction, as well as consumer benefits from reduced costs and increased network quality. Presented analyses to both DOJ and FCC.

FTC investigation of acquisition of Dollar Thrifty Automotive Group by Hertz. 2012. Served as a lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to case settlement. Conducted empirical analyses based on previous rental car mergers demonstrating likely price increases from the transaction.

Decision by Federal Communications Commission not to extend the ban on exclusive contracts for satellite-delivered, cable-affiliated networks. 2012. Lead economic expert for National Cable and Telecommunications Association. Submitted economic analysis demonstrating that the ban on exclusive distribution of satellite-delivered, cable affiliated networks is no longer warranted given increased marketplace competition. FCC made decision to allow the ban to sunset.

Successful sale of wireless spectrum by SpectrumCo and Cox ("Cable Companies") to Verizon Wireless and successful completion of related commercial agreements. 2012. On behalf of the Cable Companies, performed economic analyses demonstrating lack of competitive harm from the transaction on markets for backhaul and Wi-Fi services. Presented analyses to FCC.

Successful acquisition by LIN Media of broadcast television stations from NVTV. 2012. Lead economic expert for LIN Media. Prepared economic analysis demonstrating lack of competitive concern over potential issues related to SSA and JSA Arrangements.

Proposed acquisition of T-Mobile USA by AT&T. 2011. Served as one of the lead economists, initially for T-Mobile (along with Michael Katz) and ultimately for both parties (along with Michael Katz and Dennis Carlton). Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop, ex parte meeting.

S*uccessful application for antitrust immunity by Delta and Virgin Blue*. 2010. Together with Robert Willig, Bryan Keating, and Jon Orszag, prepared economic analyses demonstrating substantial net consumer benefits from antitrust immunity. Submitted results in expert reports to Department of Transportation.

Successful joint venture between Comcast and NBC Universal (and ultimate full acquisition of NBC Universal by Comcast). 2010. Served as one of the lead economists (along with Michael Katz) on behalf of the merging parties. Wrote multiple reports submitted to FCC (with Michael Katz) demonstrating lack of significant competitive concerns from the transaction. Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop of economists, ex parte meeting.

Successful application for antitrust immunity for oneworld alliance and associated joint venture of American Airlines, British Airways, and Iberia Airlines. 2009-2010. Together with Robert Willig and Bryan Keating, prepared economic analyses demonstrating substantial net consumer benefits associated with antitrust immunity for the joint venture. Submitted results in expert reports to Department of Transportation.

Successful acquisition by PepsiCo of bottlers, PBG and PAS. 2009. Performed econometric and simulation analyses demonstrating pro-competitive effect of merger on PepsiCo's own brands, other brands distributed by PBG and PAS, and overall marketplace. Presented results to FTC (together with Dennis Carlton).

Successful merger of Delta Airlines and Northwest Airlines. 2008. In support of Dennis Carlton, developed empirical and theoretical analyses to demonstrate merger's pro-competitive nature. Work focused on (ultimately settled) private litigation opposing the merger.

Successful acquisition of Harcourt Education by Houghton Mifflin. 2007. Along with Daniel Rubinfeld and Frederick Flyer, developed econometric analyses demonstrating lack of competitive harm from proposed merger. Presented results to DOJ.

Successful acquisition of Chicago Board of Trade by Chicago Mercantile Exchange. 2007. Along with Robert Willig and Hal Sider, developed and presented multiple empirical analyses demonstrating lack of competitive harm from merger. Submitted multiple white papers and made multiple presentations to DOJ.

SELECTED OTHER EXPERT/CONSULTING WORK

Led team supporting Dennis Carlton's testimony in Toshiba/Hannstar TFT-LCD Antitrust litigation vs. Plaintiff Best Buy, 2013.

Led team supporting Dennis Carlton's testimony in Toshiba's TFT-LCD Class Action Antitrust litigation. Named Litigation Matter of the Year for 2012 by *Global Competition Review*, 2012.

As economic expert for US Airways, developed econometric analysis of air traffic at major US airports, presented to Philadelphia Airport management team, 2011.

Prepared analysis of the competitive impact of low-cost-carrier competition in Washington, D.C. and New York airports. Filed with DOT, 2011.

On behalf of major pharmaceutical firm, developed econometric model to forecast pharmaceutical expenditures, 2009.

Developed econometric model to measure of the importance of network effects in credit cards in the context of measuring damages incurred by a major credit card issuer, 2007-2008.

OTHER CONFIDENTIAL CONSULTING WORK IN THE FOLLOWING INDUSTRIES

Automobiles and Components

Consumer Durables

Consumer Services

Financial Services

Energy

Food, Beverage, and Tobacco

Healthcare Equipment and Services

Media

Pharmaceuticals, Biotechnology, and Life Sciences

Retail

Semiconductors and Semiconductor Equipment

Software and Related Services

Technology: Hardware and Equipment

Telecommunication Services

Transportation

Utilities

PUBLICATIONS

"Guidelines Lacking Guidance: Improving the FTC/DOJ Draft Merger Guidelines," (with Daniel P. O'Brien, Jonathan Orszag, Jeremy Sandford, Loren Smith, and Nathan Wilson), available at *https://papers.ssrn.com/abstract=4575390*, September 18, 2023.

"Evaluating a Theory of Harm in a Vertical Merger: AT&T/Time Warner," (with Dennis W. Carlton, Georgi V. Giozov, and Allan L. Shampine), Chapter 5 in *Antitrust Economics at a Time of Upheaval: Recent Competition Policy Cases on Two Continents*, John Kwoka, Jr., Tommaso M. Valletti, and Lawrence J. White, eds., August 2023.

"Cheap Exclusion in Markets with Multiple Complements," (with Erica Benton and Daniel P. O'Brien), forthcoming in *International Journal of Industrial Organization*, available at *https://ssrn.com/abstract=4328818*, June 17, 2023.

"A Retrospective Analysis of the AT&T/Time Warner Merger" (with Dennis W. Carlton, Georgi V. Giozov, and Allan L. Shampine), Volume 65, Number S2, in the *Journal of Law and Economics*, November 2022.

"New Merger Guidelines Should Keep the Consumer Welfare Standard" (with Jonathan Orszag and Jeremy Sandford), *CPI Antitrust Chronicle*, November 2022.

"The Economics of the LCD Cartel: Organization, Incentives, and Practical Challenges," *Cartels Diagnosed: New Insight on Collusion* (with Dennis W. Carlton, Ian MacSwain, and Allan Shampine), available at *https://ssrn.com/abstract=4190535*, August 15, 2022.

"Vertical Mergers with Bilateral Contracting and Upstream and Downstream Investment," (with Daniel P. O'Brien), available at *https://ssrn.com/abstract=3886048*, July 15, 2021.

"International Broadband Price Comparisons Tell Us Little about Competition and Do Not Justify Broadband Regulation," working paper (with Michael Katz and Bryan Keating), commissioned by NCTA – The Internet & Television Association, May 11, 2021.

"Effects of the 2010 Horizontal Merger Guidelines on Merger Review: Based on Ten Years of Practical Experience," (with Dennis W. Carlton), Volume 58, Issue 2, in the *Review of Industrial Organization*, November 10, 2020.

"Lessons from *AT&T/Time Warner,*" (with Dennis W. Carlton and Allan L. Shampine), *Competition Policy International*, July 2019.

"Are You Pushing Too Hard? Lower Negotiated Input Prices as a Merger Efficiency," (with Thomas A. Stemwedel and Ka Hei Tse), Volume 82, Issue 2, Pages 623-642, in the *Antitrust Law Journal*, April 2019.

"Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data," (with Georgi Giozov, Nauman Ilias, and Allan Shampine), Volume 4:1 in *The Criterion Journal on Innovation*, 2019.

"Are Legacy Airline Mergers Pro- or Anti-Competitive? Evidence from Recent U.S. Airline Mergers," (with Dennis Carlton, Ian MacSwain, and Eugene Orlov), Volume 62, Pages 58-95, in the *International Journal of Industrial Organization*, January 2018.

"Competitive Effects of International Airline Cooperation," (with Robert J. Calzaretta and Yair Eilat), Volume 13, Issue 3, Pages 501-548, in the *Journal of Competition Law & Economics*, September 2017.

"Econometrics and Regression Analysis," (with Chris Cavanagh, Paul Denis, and Bryan Keating), Chapter 6 in the *American Bar Association's Proving Antitrust Damages: Legal and Economic Issues, Third Edition*, 2017.

"Do Premiums Increase After Health Insurance Mergers? – A Reassessment of Guardado et al.'s Findings," (with Robert C. Bourke, Ben Wagner, and David A. Weiskopf), available at *https://ssrn.com/abstract=2933062*, March 16, 2017.

"Complementarity without Superadditivity," (with Steven Berry, Philip Haile, and Michael Katz), Volume 151, Pages 28-30, in *Economics Letters*, December 1, 2016.

"Antitrust in a Mobile World," (with Yonatan Even, Jonathan M. Jacobson, Scott Martin, and Dr. Helen Weeds), Chapter 17 in *International Antitrust Law & Policy: Fordham Competition Law 2015*, James Keyte, ed., 2016.

"Buyer Power in Merger Review," (with Dennis W. Carlton and Mary Coleman), Chapter 22 in *The Oxford Handbook of International Antitrust Economics*, Volume 1, Roger D. Blair and D. Daniel Sokol, eds., 2015.

"Airline Network Effects and Consumer Welfare," (with Bryan Keating, Dan Rubinfeld, and Robert Willig), *Review of Network Economics*, available at *https://ssrn.com/abstract=2473243*, November 2013.

"The Evolution of Internet Interconnection from Hierarchy to 'Mesh': Implications for Government Regulation," (with Stanley M. Besen), Volume 25 in *Information Economics and Policy*, July 24, 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)," (with Bryan Keating, Daniel L. Rubinfeld, and Robert D. Willig), *The Antitrust Revolution*, Sixth Edition, John E. Kwoka, Jr. and Lawrence J. White, eds., July 2013.

"Proper Treatment of Buyer Power in Merger Review," (with Dennis W. Carlton), *Review of Industrial Organization*, July 2011.

"Response to Gopal Das Varma's Market Definition, Upward Pricing Pressure, and the Role of the Courts: A Response to Carlton and Israel," (with Dennis W. Carlton), *The Antitrust Source*, December 2010.

"Will the New Guidelines Clarify or Obscure Antitrust Policy?" (with Dennis W. Carlton), *The Antitrust Source,* October 2010.

"Should Competition Policy Prohibit Price Discrimination?" (with Dennis W. Carlton), *Global Competition Review*, 2009.

"The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," (with Jonathan Orszag), Paper commissioned by National Collegiate Athletic Association, available *at http://www.epi.soe.vt.edu/perspectives/policy_news/pdf/NCAASpending.pdf*, February 2009.

"Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance," *The American Economic Review*, December 2005.

"Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobile Insurance Firms," *The Rand Journal of Economics*, Spring 2005.

"The Impact of Youth Characteristics and Experiences on Transitions Out of Poverty," (with Michael Seeborg), *Journal of Socio-Economics*, 1998.

"Racial Differences in Adult Labor Force Transition Trends," (with Michael Seeborg), *Journal of Economics*, 1994.

SELECTED RECENT PRESENTATIONS

American Bar Association Section of Antitrust Law, "Nuts & Bolts of Presenting Economic Evidence to the Agencies: Common Pitfalls and Best Practices, Panelist, October 2019.

Dechert LLP, 2019 Annual Antitrust Spring Seminar, Keynote Speaker, March 2019.

Concurrences Review and The George Washington University Law School, 6th Bill Kovacic Antitrust Salon: Where is Antitrust Policy Going?, "A Judge's Eye View on Antitrust: Mergers, Cartels, Remedies…," Panelist, September 2018.

Fordham Competition Law Institute, 45th Annual Conference on International Antitrust Law and Policy, "Merger Remedies," Panelist, September 2018.

Georgetown Center for Business and Public Policy, "Airline Competition Conference," Panelist, July 2017.

J.P. Morgan Special Situations Investor Forum, "The Antitrust Merger Review Process," Panelist, March 2017.

American Bar Association Section of Antitrust Law, "Economic Issues Raised In The Comcast – Time Warner Cable Merger," Panelist, February 2016.

Fordham Competition Law Institute, 42nd Annual Conference on International Antitrust Law and Policy, "Antitrust in a Mobile World," Panelist, October 2015.

American Bar Association Section of Antitrust Law, "Merger Practice Workshop," Faculty Member, October 2015.

Searle Center Conference on Antitrust Economics and Competition Policy, Panel on Recent Transactions in the Telecom Industry, Panelist, September 2015.

National Bureau of Economic Research, Summer Institute 2015, Industrial Organization Meetings, "Panel Discussion of the Comcast-Time Warner Merger," Panelist, July 2015.

Federal Communications Bar Association, "How the Antitrust Agencies and the FCC are Likely to Analyze Vertical Mergers," Panelist, November 2014.

The Coca Cola Company Global Antitrust Forum, "Round Table Discussion on Use of Economics and Economists," Panel Chair, November 2014.

Compass Lexecon Competition Policy Forum, Lake Como Italy, "Consolidation of the Telecoms Industry in the EU and the U.S.," Panelist, October 2014.

The IATA Legal Symposium 2014, Aviation Law: Upfront and Center, "Merger Analysis – A sudden shift in approach by DOJ in the American Airlines and US Airways merger," Panelist, February 2014.

Georgetown Law 7th Annual Global Antitrust Enforcement Symposium, "Merger Enforcement and Policy," Panelist, September 2013.

American Bar Association Section of Antitrust Law, "Airline Mergers: First Class Results or Middle-Seat Misery?" Panelist, May 2013.

American Bar Association Section of Antitrust Law, "Go Low or Go Home! Monopsony a Problem?" Panelist, March 2012.

Federal Communications Bar Association Transactional Committee CLE Seminar, "The FCC's Approach to Analyzing Vertical Mergers," Panelist, October 2011.

The Technology Policy Institute Aspen Forum, "Watching the Future: The Economic Implications of Online Video," Panelist, August 2011.

American Bar Association Forum on Air & Space Law, 2011 Update Conference, "Antitrust Issues: What's on the Horizon for the Industry," Panelist, February 2011.

American Bar Association Section of Antitrust Law, "Antitrust in the Airline Industry," Panelist, September 2010.

GRANTS AND HONORS

Searle Fund for Policy Research Grant, 2004-2006, for "An Empirical Examination of Asymmetric Information in Insurance Markets."

Kellogg School of Management Chairs' Core Course Teaching Award, 2003 & 2005.

Bradley Dissertation Fellowship, Stanford University, 1999-2000.

Stanford University, Outstanding Second Year Paper Prize, 1997.

ADVISORY, EDITORIAL, AND TRUSTEE BOARDS

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