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Via E-mail to amitabha.bose@dot.gov

The Honorable Amit Bose
Administrator, Federal Railroad Administration
United States Department of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

RE: BNSF's Automated Track Inspection Program

Dear Administrator Bose:

BNSF writes to request that FRA promptly approve BNSF's June 15, 2021 request to implement the expansion of its automated track inspection ("ATI") program that is envisioned by the BNSF ATI waiver that has been in place since January 2021.

As detailed below, data produced by BNSF's ATI program over more than three years, facilitated through collaboration with the FRA, has conclusively established that the data-driven combination of ATI and strategically focused human visual inspection *greatly increases* the safety of our operations. Moreover, data gathered over the past year pursuant to BNSF's current waiver fully satisfies the conditions for expansion contained therein. Given this incontrovertible data, FRA's failure to approve the expansion of BNSF's ATI program unnecessarily inhibits an opportunity to further reduce risk for BNSF's employees and the communities in which we operate and amounts to a choice to favor a prescriptive, manual inspection regime uninformed by data and crafted more than 50 years ago over a modern, data-driven, ATI regime that has fully proven itself in real world operating conditions. BNSF believes this is inconsistent with FRA's core mission to enable the safe, reliable and efficient movement of goods, and more specifically, FRA's articulated vision of the track safety standards as an "evolving set of safety requirements subject to *continuous revision* allowing the regulations to keep pace with industry innovations and agency research and development."[1] For the reasons set forth below, we respectfully request that FRA promptly approve BNSF's pending expansion request.

[1] 63 Fed. Reg. 33992, 33992 (June 22, 1998) (emphasis added).

The Safety Benefits of Automated Track Inspection Are Indisputable

BNSF introduced and began collecting test data from its current automated track inspection ("ATI") technology in 2014. The ATI program uses BNSF's Unmanned Automated Track Geometry Car ("UTGC") Inspection System to take precision measurements of key geometric standards as the system passes over track segments. In September 2018, BNSF received approval from FRA to conduct a pilot program ("Pilot Program") that was designed to gather data and determine the appropriate rates and frequencies of manual and automated inspections necessary to achieve the optimal improvements in track safety and geometry defect rates.[2] Over the course of more than two years of testing during the Pilot Program, during which voluminous amounts of data were generated and shared with FRA in an incrementally phased approach, BNSF conclusively established that its ATI model could not only maintain, but far improve railroad safety by significantly reducing the number and occurrence of track defects over the program areas—including defects relating to track structure and ballast, which are not directly inspected by the UTGC Inspection System.

ATI technology has proven to be far more sensitive and effective at detecting geometry defects on BNSF's network than the regime of manual visual inspections mandated by the historic regulations. Over the course of a two-year period, BNSF compared the defect detection rate obtained during manual inspections over 39.2 million miles of track with the rate detected by its UTGC system over the same segments. Manual inspections detected only 0.01 defects per 100 miles, compared with a rate of 4.54 defects per 100 miles using ATI technology.[3] This step-function improvement in defect detection using UTGC technology highlights the key driver of the potential safety improvement – ATI technology is not only able to discover the same defects found during manual inspections, but finds far more defects that otherwise would not be detected by the human eye and detects precursor conditions before they advance into actionable defects.

The benefits of this technology are undeniable. Beyond simply being able to detect more defects, BNSF's ATI Program allows for a modernized approach to track maintenance that shifts from a reactive approach to a predictive model anticipating and focusing maintenance needs with a specificity not previously achievable. As a result, BNSF is able to redeploy its track inspectors to perform inspections for developing issues in areas specifically identified by ATI rather than dedicating that workforce to the less effective manual inspections required under the existing outdated, regulatory scheme that remains uninformed by readily available data.

This new paradigm greatly improves both safety and efficiency in several areas: it reduces track occupancy time needed for inspections and unplanned maintenance, prevents service interruptions and rail equipment incidents caused by undiscovered defects, and significantly reduces the hazards to workers associated with unnecessary manual hi-rail and/or walking inspections (both of which require an employee to foul the track). It is worth emphasizing here that simply adding ATI inspections on top of the current regulatorily-required manual inspections is not the optimal approach, from either a safety, efficiency, or rail capacity standpoint. BNSF's ATI program under the waiver drives safety improvements not otherwise achievable while increasing fluidity on BNSF's network, improving efficiency in order to serve the public (particularly critical during a period of supply chain congestion), and further reducing impacts such as grade crossing blockages that result from constraints on fluidity.

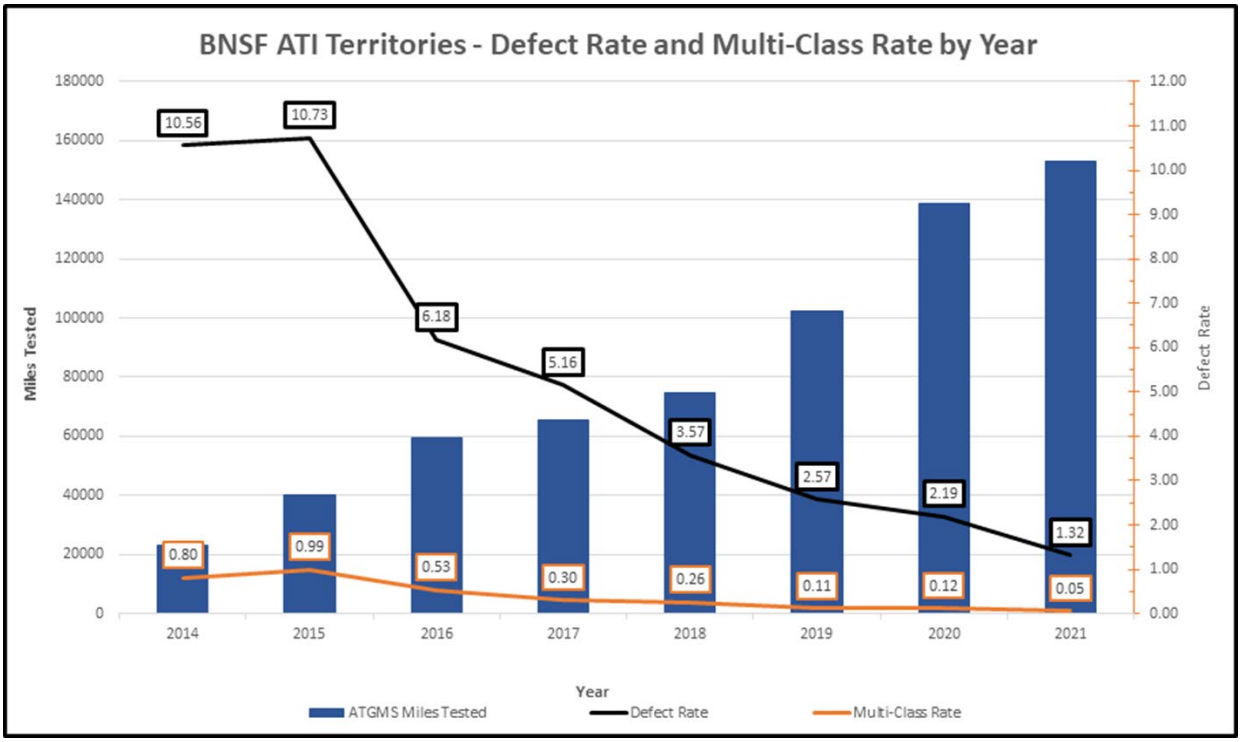
[2] Docket No. FRA-2018-0091-0001
[3] Docket No. FRA-2020-0064-0001

BNSF's ATI Program Has Been an Unqualified Success

The results of BNSF's ATI Program conclusively establish that it is not simply a replacement for the safety performance achieved by manual inspections; rather, it clearly improves safety on those segments of BNSF's rail network where the program has been permitted to be implemented. Since ATI testing first began in 2014, BNSF has and continues to collect data on the effectiveness of the program, with dramatic results as the program has progressed over time:

- As of December 31, 2021, an **88% reduction** in the overall track geometry defect rate.

- As of December 31, 2021, a **95% reduction** in the multi-class drop rate (referring to the reduction in track speeds necessitated by a defect discovered during inspections).



Through the ATI program and BNSF's waiver of the historic inspection intervals, BNSF has been able to both significantly increase track safety and performance while using our inspection workforce in a more focused manner and simultaneously reducing unnecessary exposure to on-track hazards.

BNSF was concerned to see recent FRA communications to certain Members of Congress that acknowledged the safety successes of ATI, yet also highlight that ATI was not capable of detecting certain structural defects and other issues, and that the experience with ATI programs to date demonstrates a need to focus manual inspections on such areas. BNSF was confused by this communication because, as FRA knows from working side-by-side with BNSF for more than three years, BNSF's UTGC's were never intended to detect the types of structural defects and other issues FRA referenced, and that is not in conflict with BNSF's ATI program or pending request for expansion. BNSF's ATI waiver is specific in characterizing ATI technology as a means to detect track geometry defects only, and FRA recognized that BNSF did not seek any relief with respect to other aspects of the track safety

standards, including those governing track structure, roadbed, and track appliances and devices.[4] BNSF's expansion request should not be negatively affected by the UTGCs' inability to do something that FRA acknowledged it was never intended to do in the first place.

FRA's analysis of BNSF's petition for waiver also closely considered the comments received from the Association of State Railroad Safety Managers ("ASRM") and the Brotherhood of Maintenance of Way Employees Division/IBT ("BMWED"). After noting that the degradation of track structure components typically resulted in measurable track geometry conditions before a derailment occurs, FRA categorized structural defects into three categories:

1. Defects that cannot be identified through automated track geometry or visual inspections
2. Defects that are primarily visual but are correlated to a measurable track geometry condition
3. Defects that are solely identifiable through visual inspections

FRA determined that the first group was not relevant to the waiver, as BNSF had not requested relief from the regulations regarding the detection of internal rail defects (ultrasonic testing or continuously-welded rail requirements). The second group (typically involving concerns with ballast and crossties) would continue to be identified by the twice-monthly manual inspections which BNSF still performs within the conditions of its waiver and would also be identified by automated inspections as resulting geometry conditions develop. FRA found that the third group occurred in either installed devices or in turnouts, were not normally identified during normal (hi-rail drive-by) visual inspections, and again would not be impacted by the waiver since BNSF was not seeking relief from the monthly walking inspection requirement under § 213.235. In fact, a comparison of turnout inspections on the Southern Transcon since implementation of the waiver shows no drop in the number of turnout inspections performed versus the same period the year prior.

In sum, and based on the volumes of conclusive data BNSF has submitted to the FRA during the Pilot Program, FRA found that BNSF continued to discover both geometric *and other defects* under its ATI program "despite conducting progressively fewer visual inspections." Per the FRA, the data confirmed the effectiveness of the program notwithstanding the concerns raised by ASRM and BMWED:

> "Based on this data, FRA concludes that BNSF's visual inspection algorithm and monthly required on-foot inspections of turnouts significantly mitigate any potential risk resulting from decreasing visual inspections. FRA's analysis of this data further demonstrates that the quality of track inspections is more indicative of the safety impact than the frequency, and that monthly walking inspections of turnouts coupled with ATGMS and visual inspection frequency of other locations, will maintain the overall safety of the track being inspected."[5]

Visual track inspections remain an important component of BNSF's current ATI Program and pending waiver expansion request and are not ignored by the waiver. To the contrary, BNSF affirmatively

[4] Specifically, FRA's waiver approval stated that BNSF's program "was designed to evaluate the optimal combination frequency of visual and TGMS inspections, inherently recognizing the current ATGMS technology cannot replace visual inspections entirely" and found that BNSF's waiver request "adequately recognizes this limitation" and that the relief requested would not diminish the effectiveness of detecting non-geometry-related defects. *Id*., at 4.

[5] Decision Letter, FRA-2020-0064-0011 (Jan. 19, 2021) at 8.

identified the need to continue with visual inspections and recognized that maximizing ATI where it can produce the best safety results would free up human inspectors to focus more intently on those areas the technology is not intended to address.

BNSF Has Clearly Satisfied FRA's Pre-Conditions for Expansion

FRA's Railroad Safety Board approved BNSF's current waiver to utilize ATI with relief from the historic inspection schedule required by § 213.233(b)(3) and (c) on January 19, 2021.[6] Based upon the success proven in the Pilot Program, the FRA approved the program's immediate implementation on two specific territories covering more than 5,970 miles of BNSF's network, BNSF's Powder River Division as well as BNSF's Southern Transcon route from Los Angeles to Chicago (which handles more volume annually than any other route on the BNSF network). The waiver explicitly envisioned expansion to additional territories conditioned only upon successful implementation across these initial territories.[7] As discussed below, BNSF has fulfilled this condition and, from BNSF's perspective, every day BNSF is not running the ATI program on the Northern Transcon is a lost opportunity to improve safety.

The implementation of ATI across the Southern Transcon has been unquestionably successful. Compared to 2020 (the year prior to implementation), over the past year BNSF has achieved a **46% improvement** in the defect rate over the 4,635-mile route, with a **59% improvement** in the multi-class drop rate, while meeting compliance with all of the conditions provided in the waiver. In addition, BNSF has seen further evidence that adjusting the inspection frequency categories to a more aggressive stance based on conditions raises confidence in the ability of the Inspection Frequency Model to minimize down-time while maintaining high safety standards.

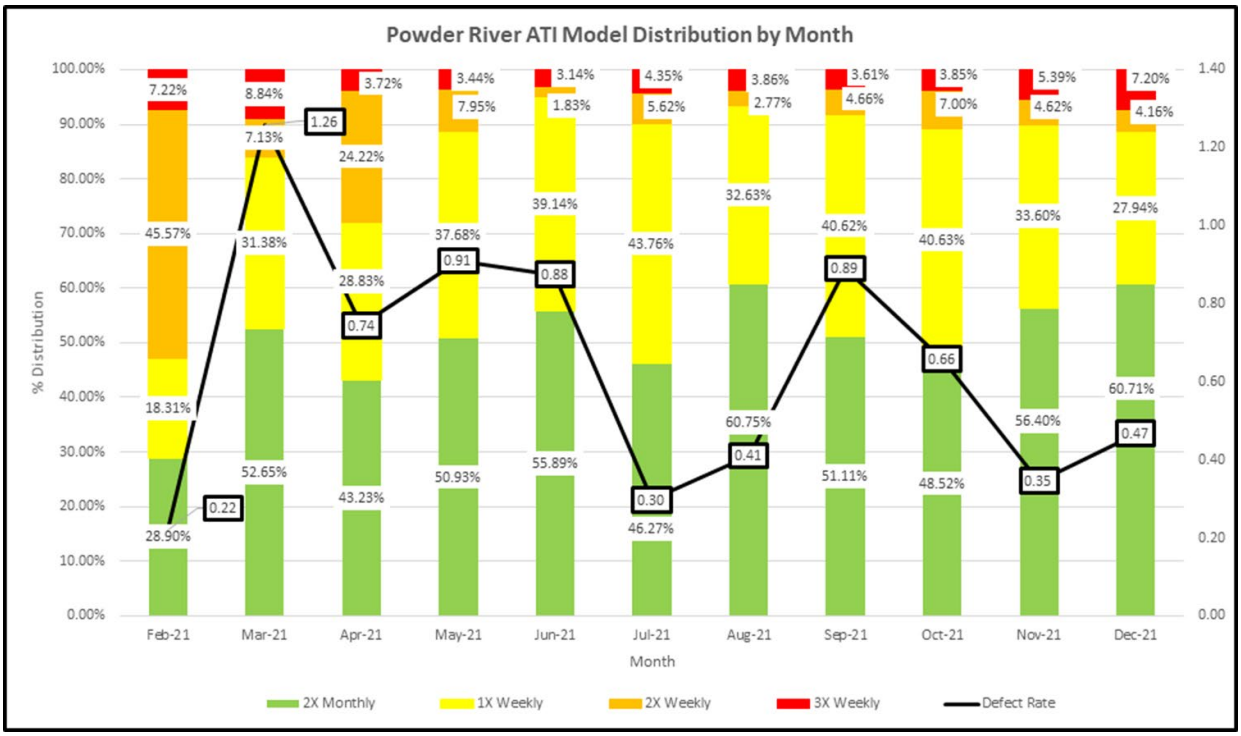
In approving BNSF's waiver, the Safety Board stated concern over the impact of differing weather, geographical, and operational conditions found in different territories across BNSF's network. We note however that one of the reasons that the Powder River Division was chosen as the location for the Pilot Program was because of the varied conditions found across that territory: the wide variations in terrain, grades, weather, and operational conditions across the territory provided data showing that the technology could be applied across the range of conditions found there.

Moreover, BNSF's petition for waiver uses a progressive, performance-oriented approach to implementation and use of the program and waiver conditions. As provided in the waiver, BNSF must achieve necessary performance levels (2.0 defects per 100 miles tested – a 60% reduction from the 5.0 defects per 100 miles detected by visual inspections alone) in order to use a reduced inspection frequency. This progressive structure inherently protects the regulatory standard across variances in conditions by requiring increased visual inspections if the program is not achieving the significant safety advances it can produce.

BNSF has successfully utilized this progressive structure as conditions dictate. For instance, when snow accumulation impacted the effectiveness of automated inspections over the Powder River Division in February of 2021, BNSF increased the number of visual inspections until conditions improved and the effectiveness of automatic inspections returned to expected levels. In fact, under the current program, BNSF increases the manual visual inspection frequency to up to 150% of the frequency required under

[6] *Id*.
[7] *Id*.

the historic regulations in cases where the data indicates marginal conditions may exist. The following graphic illustrates the dynamic adjustments made by BNSF to maintain a performance-based standard.



Accordingly, the performance-based requirements reflected in BNSF's program and the existing waiver conditions account for adjustments necessary to implement the ATI program over varying territories and conditions.

Conclusion

The safest and most efficient track inspection processes are those that produce the best data-supported track safety outcomes while minimizing human risk exposure and limiting precious track occupancy time in order to maximize rail freight supply chain velocity and capacity. As BNSF's ATI program has demonstrated, similar safety outcomes cannot be achieved by simply bolting expanded use of ATI on top of existing, decades-old, prescriptive regulations requiring visual inspections at certain time-based intervals that are not guided by any safety data. Minimizing railway worker inspector exposures through expanded use of ATI produces a better overall safety outcome, something that cannot be achieved without FRA approval of the pending expansion request.

BNSF is aware of FRA's stated intention to continue the RSAC task relating to track inspection to eventually result in a rulemaking. BNSF fully supports the consensus-based model of rulemaking where all stakeholders can negotiate in good faith to achieve optimal safety outcomes and has consistently shared its results with the RSAC working group. That said, the RSAC/rulemaking process often takes years. There have been only two substantive revisions to the Track Safety Standards since 1971, and the inspection interval regime has not been changed since it was enacted 50 years ago. Given that the indisputable safety benefits of BNSF's mature, proven ATI program can be expanded now, it would be arbitrary and capricious for FRA to deny BNSF, its employees, and the communities in which we operate the benefits of that safety improvement until a Final Rule is issued some number years from now. BNSF

has voluntarily invested significant resources in advancing this next-generation safety improvement, and is ready to further that investment and the realization of the overwhelming benefits it brings pending FRA's approval of expansion of the program. Granting BNSF's expansion request is significantly more consistent with FRA's core mission than the existing regulatory standard. We therefore urge FRA to approve BNSF's pending expansion request without further delay.

Sincerely,

John Cech

cc: Mr. Karl Alexy