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Karl Alexy
Associate Administrator for Railroad Safety
Federal Railroad Administration
1200 New Jersey Ave., S.E.
Third Floor West
Washington, D.C. 20590

Via email at: FRAWaivers@dot.gov

Re: TGMS Waiver Petition

Dear Mr. Alexy:

The Association of American Railroads seeks a waiver on behalf of its members allowing the use of a combination of Track Geometry Measurement System (TGMS) and visual track inspection methods and frequencies in lieu of the visual track inspection requirements under 49 CFR § 213.233(b)(3) and (c). This waiver would allow railroads to build on existing TGMS programs that have a demonstrated record of success and will provide FRA with additional data to assess the railroads' TGMS programs as it considers implementing new regulations governing the use of TGMS. The waiver is in the public interest and consistent with railroad safety because it will result in earlier detection and remediation of track defects, reduce visual inspections that are a potential source of injury, and improve operational efficiency.

TGMS technology is far superior to the human eye in identifying certain types of defects in railroad tracks. In FRA's TGMS NPRM published on October 24, 2024, the agency "acknowledges the safety benefits of this technology, specifically its ability to quickly and accurately detect small changes in track geometry." 89 Fed. Reg. 84845, 84846. The U.S. Court of Appeals for the D.C. Circuit has also noted that "automated inspections have proven to be significantly more effective at detecting and measuring geometry conditions" than visual inspections. *Bhd. of Maint. of Way Employes Div./IBT v. U.S. Dep't of Transp.*, 781 F. App'x 7, 10 (D.C. Cir. 2019). Similarly, as the United States Court of Appeals for the Fifth Circuit observed, "FRA found" that BNSF's use of Automated Track Inspection technology "identified two hundred defects for every one identified by visual inspection, improved the efficiency of the strategically employed visual inspections, and decreased the number of workers on the tracks." *BNSF Ry. Co. v. FRA*, 62 F.4th 905, 909 (5th Cir. 2023).

The primary benefit of using automated inspection technologies is earlier detection of track defects enabling railroads to switch from reactive to preventative maintenance practices. A strictly visual approach to inspections results in defects only being addressed when they become apparent to an inspector observing the track. In contrast, using TGMS—which collects massive amounts of data that can be analyzed for patterns or warning signs—enables a modernized approach to track maintenance shifting from a reactive approach to a more predictive model, thereby enabling railroads to redeploy

track inspectors to perform inspections for developing issues in areas specifically identified by the automated system.

TGMS systems also provide a safety benefit by reducing potential sources of injuries tied to visual inspections. Because visual inspections rely on employees taking measurements on active railroad tracks, an automated system reduces the dangers to railroad employees who otherwise would need to drive over the tracks themselves or walk alongside the tracks. Indeed, the National Transportation Safety Board recently pointed to this issue in its 2021-2022 Most Wanted List of Transportation Safety Improvements, explaining that "[t]oo many people working on or around railroad tracks . . . are getting killed or injured in preventable accidents" and urging FRA to "act now . . . to establish adequate . . . protections."[1]

Lastly, TGMS systems improve the rail network's efficiency. TGMS enables railroads to identify and remediate track defects more quickly, which reduces service interruptions. TGMS also allows railroads to increase the capacity and fluidity of rail lines by reducing the track time consumed by dedicated inspection vehicles, thus eliminating delays that arise when tracks cannot host freight or passenger traffic because they are being inspected.

Proposed Conditions for the Waiver

(a) **Frequency of Inspections** - Track owners may elect to use the following combination of track inspection methods and frequencies in lieu of the visual track inspection requirements under 49 CFR § 213.233(b)(3) and (c). For a route or territory specified in paragraph (c) below, the defect metric (as determined by the number of verified 49 CFR part 213, subpart C, exceptions detected by TGMS in a given month on the given route or territory and unprotected at the time of test, divided by the number of miles tested in that month on that route or territory, divided by 100 miles) for the previous month must be at or below four defects per 100 miles of TGMS testing and the multiclass drop defect (exceptions other than tight gauge requiring the reduction of track class by more than one class) metric must be at or below 0.2 defects per 100 miles of TGMS testing. When a track owner performs at least one TGMS inspection each month on a route or territory specified in paragraph (c), each main track and siding will be traversed by vehicle or inspected on foot at least once every month and each main track and siding will be visually inspected at least twice per month.

(b) **Missed Inspections and Remedial Period**

1. If a track owner is unable to meet the required TGMS inspection frequency on a route or territory or portion thereof under paragraph (a), the track owner must comply with § 213.233 for that portion of track on which the frequency was not met, starting in the next subsequent inspection week and until the next TGMS inspection is performed.

[1] Improve Rail Worker Safety (May 3, 2021). https://www.ntsb.gov/Advocacy/mwl/Pages/mwl-21-22/mwl-rph-02.aspx

2. If a track owner fails to attain the required defect metric specified in paragraph (a) for two consecutive months on a route or territory, it must revert to the visual inspection frequencies in § 213.233 for the affected route or territory until the required defect metric is restored.

(c) **Notification Prior to Implementation** - Upon electing to use the alternative track inspection methods in paragraph (a) on a given route or territory, the track owner must notify FRA in writing which routes or territories are being inspected at such alternate frequencies, specifying milepost limits and track designations where appropriate. The track owner must also notify the FRA in writing with respect to any additions, reductions or changes related to the list of routes or territories, or the milepost limits or track designations of a specific route or territory. Compliance with waiver conditions shall be measured separately for each defined route or territory, and track segments within a defined route or territory shall not be disaggregated for purposes of measuring compliance with waiver conditions except as described in (b)1.

(d) **Record Keeping Requirements and Reports** – For any routes or territories identified by the track owner in paragraph (c), the track owner will maintain for one year and make available to FRA upon request records evidencing compliance with paragraphs (a) and (b) of this section as well as the following inspection data for each route or territory specified in paragraph (c):

(i) Exception reports for each route or territory inspected consisting of:

(A) the date and location of limits of the inspection; and

(B) the type and location of each exception.

(ii) Monthly summaries for each route or territory specified in paragraph (c) consisting of:

(A) the number of single- and multi-class TGMS exceptions found;

(B) the number of miles tested;

(C) the number of visual inspections performed; and

(D) the number of visually detected exceptions.

(e) **Performance Standard for TGMS** –Vehicles taking measurements within five feet of an axle applying at least 50,000 pounds of vertical load and otherwise meeting the existing requirements in subsections 213.333(b), (c), and (e) for high-speed operations, and hi-rail type vehicles having a weight less than 10,000 pounds per wheel and otherwise meeting the existing requirements in subsections 213.333(b), (c), and (e) for high-speed operations, are deemed approved to conduct the TGMS inspections under paragraph (a) of this section.

(f) **Exception Handling** – Following a track inspection performed under paragraph (a), the track owner shall, within 72 hours (48 hours for multi-class exceptions) after the inspection, field verify or institute initial remedial action for all exceptions to the class of track.

Technical Bases for the Proposal

Verification Requirement

AAR proposes that the defect metric for a route or territory will be based on the number of verified exceptions to 49 CFR part 213, subpart C, detected by TGMS in a given month. Verification is necessary to ensure that erroneous TGMS exceptions are not included in the metric. Railroads use different methods for verifying defects. Verification of defects would include field-verification or other acceptable verification methods.

Track Geometry Defect Threshold

AAR proposes that the number of defects for the previous month must be at or below four defects per 100 miles of TGMS testing. AAR selected four defects per 100 miles as a threshold because it is significantly below the industry's average defect ratio, yet would allow railroads to use the performance standard on much of the system, enabling them to realize the safety benefits of TGMS across the rail network.

It is important not to select a defect ratio so low that it will not permit application of the performance standard over much of the railroad network. However, it should be noted that over time the defect ratio achieved will be much lower than the qualifying threshold. The pilot programs and waivers demonstrated that as enhanced track geometry inspections are repeated over track, the number of defects and the defect ratio decreases. To illustrate, the defect ratio for the track subject to pilot programs and waivers prior to the start of those programs and waivers was 3.08. As those programs and waivers progressed and enhanced track geometry inspections occurred, the defect ratio on that track was reduced to 0.24 (over the life of the programs).[2]

The industry average defect ratio prior to the institution of the pilot programs and waivers was 5.91 defects per 100 miles inspected, systemwide.[3] While an argument could be made that the threshold defect ratio for a performance standard should be close to that number or even higher so that the performance standard would encompass as much of the railroad network as possible, AAR proposes a threshold ratio of 4.0 to strike an appropriate balance between the desire to cover much of the network and a ratio that would still, even initially, be a significant improvement over the systemwide pre-pilot program/waiver ratio.

Multiclass Drop Threshold

AAR proposes a multiclass drop defect threshold of at or below 0.2 defects per 100 miles of TGMS testing. Arguably, such a threshold is an unnecessary addition to the track geometry defect ratio ceiling. Indeed, not all the pilot programs and waivers addressed multiclass drops. As a conservative matter, AAR is proposing such a threshold. Similar to the considerations in setting the track geometry defect ratio, one challenge is not to set a multiclass drop defect threshold so low that application of the performance standard is precluded across a significant portion of the network. In particular, seasonal effects are a concern. The 0.2 multiclass defect threshold would be stringent but not to the point that it

[2] *See* AAR's presentation of pilot program and waiver data to the Track Geometry Working Group, RSAC document number TG2019-23-01-18-09, https://rsac.fra.dot.gov/portal/Private/task_detail/82, slide 7 ("AAR Presentation").
[3] *See* AAR Presentation, slide 7.

would limit applicability of the performance standards to tracks with unusually low degradation rates and exceptionally limited seasonal effects.

TGMS and Visual Testing Frequencies

The proposed testing frequencies of one TGMS per month ensures track safety, and one human traversal and two human inspections per month ensures conditions not detected by TGMS are found and addressed, as these are slower growth in nature. There is no change in the frequency of walking inspections.

The frequencies are justified by the prior test programs that reduced visual inspections below once per week, which demonstrated that safety is not compromised. However, the testing frequencies would serve as a baseline requirement. A railroad may choose to conduct visual inspections more often. Those decisions would be based on the track owner's particular policies or the track inspector's discretion to inspect more frequently.

Missed TGMS Inspection Frequencies

Under the proposal, if a railroad does not meet the required TGMS testing frequency for any territory or portion of track, it must comply with § 213.233 for that portion on which the frequency is not met, starting in the next subsequent inspection week. All railroads have used a similar method, so the risk reduction proven in the tests is implicit here. Railroads have found that increased hi-rail inspections starting on the following week after instances of missed TGMS inspections does not result in track safety issues. Additionally, from the perspective of what is practical, employees need to plan for their week and without this provision they could find themselves in a position of non-compliance retroactively.

Failure to Meet the Required Defect Metric

AAR proposes that if a track owner fails to attain the required defect metric for two consecutive months on a route or territory, then it must revert to the visual inspection frequencies in § 213.233 for the affected route or territory until the required defect metric is restored. The reason for two months for using a two-month time frame is to ensure that if conditions deteriorate and maintenance occurs late in the first month (and due to test frequencies, the results of this work are not captured within the test results for that first month), that the safety benefits are not lost during the second month. The second month is used as a "cure" period in which the railroad will improve the metric through a combination of testing, inspection, and/or increased maintenance activity. However, this serves as a baseline for reversion to the § 213.233 requirement, and each railroad may differ in its approach after considering the circumstances and resources available.

One-Year Record Retention

AAR proposes a one-year record retention requirement because that is sufficient for FRA to determine compliance, as demonstrated by FRA's use of a one-year retention requirement for train operations at track Classes 6 and higher (§ 213.369). If the railroad needs data for predictive modelling beyond one year, that is their choice, but it is unlikely that a railroad will need one year of data at that. For example, one Class I railroad uses algorithms specifically designed to require no more than one year of data. Data

storage at this scale gets to be quite costly. However, a one-year retention requirement would not prevent FRA from storing the data that the railroads submit for as long as FRA prefers.

AAR further proposes to explicitly define the records subject to the retention requirement in order to ensure alignment across railroads and System Management Teams on the records that will be relied upon to verify compliance with the waiver.

Under Load Measurement

AAR proposes to allow TGMS inspections using hi-rail type vehicles that otherwise meet the requirements in § 213.333(b), (c) & (e) but having a weight less than 10,000 pounds per wheel. FRA previously approved numerous hi-rail vehicles of this type with wheel weights well below this value during the test programs. While the high-speed requirements for TGMS vehicles were not part of the test programs, the railroads believe that those requirements are reasonable, subject to two modifications. AAR proposes to allow TGMS inspections using vehicles taking measurements within five feet of an axle and applying at least 50kip of vertical load and hi-rail type vehicles having a weight less than 10,000 pounds per wheel, as long as the vehicles otherwise meet the existing requirements in subsections 213.333(b), (c), and (e) for high-speed operations. FRA previously approved using vehicles meeting these criteria in the test programs. They have proven effective. Failure to include these exceptions from the TGMS requirements would unnecessarily restrict the number of TGMS suppliers able to participate in railroad TGMS programs and potentially adversely affect the ability of Class II railroads to utilize the performance standard. Note that the language included here would preclude, for example, the use of an aerial drone.

Timing for Exception Handling

AAR proposes handling single-class defects within 72 hours (from the time of the actual test, not back-office validation, or notification) and multi-class defects within 48 hours. The 72-hour timeframe is reasonable for single-class defects, as railroads have found that FRA's contractor routinely takes longer than 48 hours just to make an initial notification with no ill effects. However, the railroads believe that the high-speed requirement makes more sense for multi-class defects but used "48 hours" rather than "two days" because "48 hours" is less subject to interpretation than "two days." For example, a condition tested in the early hours of Monday could be compliant if addressed late in the day Wednesday under a 2-day standard but would need to be addressed Tuesday night or very early Wednesday morning under a 48-hour standard.

For these reasons, AAR respectfully requests a waiver consistent with this petition for a period of not less than five years.

Sincerely,

Stephen N. Gordon