DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DOCKET NO. NHTSA–2020-0106
FRAMEWORK FOR AUTOMATED DRIVING SYSTEM SAFETY

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS AND THE AMERICAN SHORT LINE AND REGIONAL RAILROAD ASSOCIATION

The Association of American Railroads ("AAR") and the American Short Line and Regional Railroad Association ("ASLRRA"), on behalf of themselves and their member railroads, submit these comments in response to the National Highway Traffic Safety Administration's ("NHTSA") advance notice of proposed rulemaking ("ANPRM"), *Framework for Automated Driving System Safety*, addressing Automated Driving System ("ADS") safety for motor vehicles.[1] AAR is a trade association representing the interests of North America's railroads, including the seven Class I freight railroads, scores of short line and regional freight railroads, the National Railroad Passenger Corporation ("Amtrak"), and numerous commuter railroads. AAR's freight railroad members account for the vast majority of U.S. freight rail mileage, employees, traffic, and revenue, while Amtrak and the various commuter railroads in the aggregate account for the majority of all intercity and commuter rail passenger trips. ASLRRA is a non-profit trade association representing the interests of over 500 short line and regional railroad members and railroad supply company members in legislative and regulatory matters. Short lines operate 50,000 miles of track in 49 states, touching in origination or termination one out of every four

---

[1] 85 Fed. Reg. 78,058 (Dec. 3, 2020).

cars moving on the national railroad system, servicing customers who otherwise would be cut off from the national rail network. AAR and ASLRRA are committed to safety in the railroad industry, including in areas where rail intersects with other modes.

The ANPRM requests comment on NHTSA's development of a framework to govern and manage the safety of ADS performance for autonomous motor vehicle operation while ensuring the needed flexibility for the motor vehicle industry to enable further technological innovation. This ANPRM parallels other recent efforts across the U.S. Department of Transportation ("DOT") to propel automated transportation technology. For example, DOT recently introduced its *Automated Vehicle Comprehensive Plan*, addressing emerging technologies such as autonomous vehicles that have the potential to improve safety, transform mobility, and promote economic growth.[2] Also, the Federal Motor Carrier Safety Administration ("FMCSA") issued an information collection regarding opinions of ADS before and after hands-on demonstrations with ADS technology.[3]

AAR and ASLRRA request that all DOT agencies take a consistent approach toward safety advancements and technological innovation related to the development of autonomous technology across the various modes of transportation, including for railroads. As discussed in the ANPRM, automated technology innovations have the potential to reduce or eliminate human error crashes and to save lives. Unlocking the potential of automated technology by reducing or eliminating human error is just as important for railroads as it is for other transportation modes, and we encourage DOT to include FRA and the railroad industry in such

---

[2] *See* U.S. Department of Transportation*, Automated Vehicles Comprehensive Plan*, Jan. 2021; available online at: https://www.transportation.gov/sites/dot.gov/files/2021-01/USDOT_AVCP.pdf.

[3] 85 Fed. Reg. 69,678 (Nov. 3, 2020).

discussions. AAR and ASLRRA also request that the development of ADS technology and any future ADS regulation fully account for safe motor vehicle interaction with highway-rail grade crossings and trains.

I. RAILROADS ARE COMMITTED TO SAFETY AND ARE GETTING SAFER THROUGH INNOVATION AND TECHNOLOGY.

Railroads are an extremely safe way to move freight, and every day railroads are working to improve infrastructure and equipment safety, reduce human error, and protect the rail network. The rail industry has lower employee injury rates than most other sectors, including trucking, airlines, manufacturing and construction, and even the food and beverage industry. DOT regulations that facilitate technological innovation and provide the ability to use modernized practices enable railroads to build on the industry's outstanding safety record. For example, modern track inspection and maintenance practices have resulted in an approximately 53 percent decrease in the track-caused accident rate in the last twenty years.[4] Through modernized training, safety oversight programs, and the use of newer safety technologies, the rate of human-factor-caused accidents has dropped approximately 30 percent in the last 20 years.[5] The railroad employee injury rate is also down approximately 52 percent since 2000, with 2020 data representing a record low.[6]

The rail industry has achieved these improvements, in part, through private investment in network maintenance and capital expenditures of over $439 billion since 2000. In addition, innovation and technology have driven recent safety gains and are expected to drive more.

---

4 https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/TenYearAccidentIncidentOverview.aspx.

5 *Id*.

6 *Id*.

New technologies are used to monitor network and equipment health in real-time, unmanned aerial systems ("UAS") assist rail workers inspect hard-to-reach bridges, and positive train control ("PTC") systems reduce or prevent human-error-caused train accidents.

Recognizing that highway-rail grade crossing incidents and trespassing on railroad property account for the vast majority of railroad-related fatalities, railroads also invest heavily in grade crossing safety. Railroads spend millions of dollars each year on highway-rail grade crossing warning systems, to close, improve, and maintain grade crossings, and on public safety educational programs, including Operation Lifesaver, a non-profit dedicated to improving safe behavior at highway-rail grade crossings. AAR and ASLRRA members also support DOT's program under 23 U.S.C. § 130, which allocates approximately $230 million annually to states for highway-rail grade crossing safety improvements. These efforts, in part, have resulted in approximately a 75 percent reduction in highway-rail grade crossing accident deaths in recent years when compared to certain 1970's-era data. However, more work remains to be done to continue to improve grade crossing safety.

II. INNOVATIONS IN AUTONOMY SHOULD BE ENABLED TO DRIVE SAFETY IMPROVEMENTS ACROSS ALL MODES OF TRANSPORTATION, INCLUDING RAIL.

The promise of autonomous technology is not confined to just passenger and commercial motor vehicles but offers opportunities for safety improvement in all modes of transportation, such as rail, aviation, and maritime. Railroads in particular are an essential component of the U.S. transportation network. DOT predicts that by 2040, the U.S. will see a 40 percent increase in national freight shipments, underscoring the need for the continuing

viability of rail to ease the strain on our nation's public infrastructure.[7] One train can carry the freight of hundreds of trucks, which will help reduce highway congestion.[8] On average, freight railroads are 3-4 times more fuel efficient than trucks. [9] Moving freight by train instead of truck reduces greenhouse gas emissions for such transportation by up to 75 percent.[10]

To keep pace with economic growth while providing environmentally sound transportation alternatives, DOT must facilitate safety automation in all modes of transportation, including rail, aviation, and maritime. Each of these types of transportation will develop automated systems of their own, and while they may not need to sense, perceive, plan, and control for all the same things as ADS, such autonomous systems will need to perform similar functions. The ANPRM should serve as a model for other DOT agencies, because it eschews prescription of specific design characteristics and instead allows developers of ADS technology to "use performance-oriented approaches and metrics that would accommodate the design flexibility needed to ensure that manufacturers can pursue safety innovations and novel designs in these new technologies."[11] As the ANPRM notes, "issuing premature regulations could even increase safety risk with unintended consequences."[12] AAR and ASLRRA

---

[7] *See* U.S. Department of Transportation*, DOT Releases 30 Year Freight Projections*, Mar. 3, 2016; available online at: https://www.transportation.gov/briefing-room/dot-releases-30-year-freight-projections.

[8] *See* Association of American Railroads, *Freight Railroads & Climate Change*, Mar. 2021; https://www.aar.org/wp-content/uploads/2021/02/AAR-Climate-Change-Report.pdf.

[9] *Id.*

[10] *Id*.

[11] 85 Fed. Reg. at 78,059.

[12] *Id*. at 78,062.

support NHTSA's ANPRM as a model for other modes of transportation and agrees it will provide "sufficient flexibility for new and more effective safety innovations."[13]

It will be important for other DOT agencies such as FRA, FAA, and FMCSA to encourage their development through a consistent approach. When it comes to a uniform regulatory path toward autonomy and other technological innovations, governmental policy should be mode neutral. Not only will the public benefit from technology-driven safety gains in rail and other industries, but a mode-neutral approach will ensure a level playing field among all transportation options.

III. NHTSA SHOULD ENSURE THAT ADS PROPERLY ACCOUNTS FOR INTERACTIONS WITH HIGHWAY-RAIL GRADE CROSSINGS.

As discussed in the ANPRM, ADS has the potential to enhance safety by preventing, reducing, or mitigating accidents involving human error and poor choices. In the railroad realm, FRA has explained that nearly all deaths at rail-highway grade crossings are preventable, indicating that "94 percent of train-vehicle collisions can be attributed to driver behavior or poor judgment."[14] Trains cannot stop or change direction at grade crossings, so motor vehicles are legally required to yield to trains. Yet many motor vehicle operators do not obey the law. In 2020, 203 people were fatally injured as a result of collisions with trains at highway-rail grade crossings. If developed and deployed properly, ADS has the potential to drastically reduce the

[13] *Id*.

[14] Federal Railroad Administration, Office of Railroad Policy and Development, Report No. RR-16-10 *Analysis of Grade Crossing Accidents Resulting in Injuries and Fatalities May 2016*; available online at: https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/15767/RR_GX%20Task%20Force_Data%20Analysis_Final.pdf.

number of train-vehicle collisions and to save thousands of lives over the course of future decades.

In most instances, grade crossings have either active warning devices (*e.g.*, gates, lights, and audible warning devices) or passive warning devices (*e.g.*, signage such as railroad cross bucks or stop signs). To maximize the safety benefits of ADS technology, it must be designed to recognize all highway-rail grade crossings and to respond appropriately to all active and passive grade crossing warning devices and approaching trains. Just as the ADS must be able to sense, perceive, plan, and control the vehicles through busy roadway intersections, it must also be able to sense, perceive, plan, and control the vehicle at highway-rail grade crossings. While the ANPRM does not mention highway-rail grade crossing interactions, development of ADS to appropriately address such interactions would not be significantly different from other traffic signals and situations that must be accounted for. Like traffic interactions at intersections, the ADS will also require the ability to visually detect approaching trains and account for any variables that might obstruct a vehicle's view. In addition to the visual detection of approaching trains, ADS should be able to recognize other signs of the presence of a locomotive and/or train, such as locomotive headlights, horns, and bells. Once the technology has confirmed that it is safe to cross and there is sufficient space on the opposite side of the crossing for the motor vehicle to clear the railroad tracks, it also should ensure an appropriate movement over the crossing to prevent the vehicle from stopping on the tracks due to shifting gears, traffic queueing, or for other reasons.

Whenever possible, ADS must also be developed to route vehicles over grade separated crossings (where public roadways and railroad rights-of-way are physically separated by

underpass, bridge, or other infrastructure), or to avoid traveling over crossings altogether. As NHTSA explained in the ANRPM, "planning" is the core ADS safety function that "refers to the ability of an ADS to establish and navigate the route it will take on the way to its intended destination", including to "create a path that mitigates crash risks".[15] An ADS system that selects routes utilizing grade separated crossings (or that avoids unnecessary travel over crossings altogether) eliminates the risk involving a motor vehicle's potential collision with a train at an at-grade crossing.

As entities develop and test ADS technology, it is important that safe highway-rail grade crossing interactions are included in those tests. To the extent performance-based standards require manufacturers conduct sophisticated obstacle-course-based autonomous vehicle testing, such testing should include highway-rail grade crossing interactions. Similarly, as ADS developers simulate scenarios and closed-course test them, AAR and ASLRRA support the inclusion of highway-rail grade crossings scenarios in that simulation and testing. Indeed, many rail-related technologies are developed and tested at the Transportation Technology Center, Inc. ("TTCI") in Pueblo, Colorado, widely considered the finest rail research facility in the world. TTCI provides a safe, controlled environment under the guidance of industry-leading researchers to conduct testing of a variety of technologies. Finally, since ADS developers are already conducting limited real-world operations, they should be required to coordinate with operating railroads as they test grade-crossing-related autonomous vehicle interactions, to ensure the safety of the railroad and the public during testing.

[15] 85 Fed. Reg. at 78,063.

In sum, while automated vehicles have the potential to drive improvements in grade crossing safety, these improvements must be accomplished by technology that recognizes when a vehicle is approaching a highway-rail grade crossing, responds appropriately and lawfully to an approaching train and grade crossing warning devices, and recognizes when it is safe to proceed over a crossing. ADS should also be developed to avoid vehicles traveling over at-grade crossings whenever possible. Appropriate development of ADS to account for highway-rail grade crossings will reduce, if not eliminate, human error-caused accidents at highway-rail grade crossings.

CONCLUSION

AAR and ASLRRA support NHTSA's approach to safely, efficiently, and effectively develop ADS in a manner that encourages future innovation. The same approach should be adopted for other modes, including rail. The railroads appreciate NHTSA's thoughtful consideration of these comments.

Respectfully submitted,

Kathryn D. Kirmayer
General Counsel
Association of American Railroads
425 3rd Street, SW, Suite 1000
Washington, DC 20024
(202) 639-2100

Sarah Grimmer Yurasko
General Counsel
American Short Line and Regional Railroad Association
50 F Street, NW, Suite 500
Washington, DC 20001-1597
(202) 585-3448

April 1, 2021