

Freight Rail & Highly Automated Vehicles

Key Takeaway: The development of new technologies, including autonomous vehicles, offers the unique opportunity to dramatically improve the safety of our nation's roads. These and similar technologies can also help address many of the challenges our nation faces in improving our freight-moving capabilities to meet the needs of tomorrow. It is essential that Congress and the U.S. Department of Transportation (DOT) facilitate the development and incorporation of these technologies with a focus on both of these goals.

A highway-rail grade crossing is a location where a railway and roadway intersect at the same level. There are more than 200,000 of these crossings in the United States. Autonomous vehicles have the potential to substantially improve grade crossing safety by reducing or eliminating human error by motor vehicle drivers. AAR has submitted comments to both the DOT and other relevant Congressional Committees to ensure that highly automated vehicle technologies include such capabilities.

Autonomous vehicles need certain safety capabilities.

To turn theory into reality, autonomous vehicles should have the following capabilities in the future, which will help save lives. It is imperative that Congress and DOT encourage and foster the development of such technologies.

- Autonomous vehicles should be able to recognize when they are approaching grade crossings by identifying the various signs and pavement markings associated with those grade crossings. There should be sufficient technological redundancies in place in order to ensure that autonomous vehicles retain the capability to make these determinations in various types and degrees of weather conditions, as well as if signage were down or misplaced or if road conditions were seriously deteriorated.
- Autonomous vehicles should be able to detect approaching trains, including identifying locomotive headlights, horns, or bells and account for any variables that might obstruct their view.
- Autonomous vehicles should not begin crossing tracks unless they will be able to fully move through them. Stopping on tracks because of traffic queueing or other causes creates a dangerous situation that can be prevented with highly automated vehicle technology.
- It is important for designers of autonomous vehicles to understand that Positive Train Control (PTC) was not deployed across the entire rail network and does not have the capability to communicate train location or speed information to highway vehicles in any event.

Freight railroads need a level-playing field.

Automation promises to significantly enhance other areas of rail safety beyond grade crossings. Automated technologies can detect a wider range of defects, respond faster, and provide a larger window for action than a safety system that is subject to the limitations inherent in human eyes, minds, and hands. Automated track inspections can reduce track defects, leading to fewer accidents. Likewise, automated inspection of locomotives and freight cars has been shown to reduce the occurrence of broken wheels and other mechanical problems.

Unfortunately, due to the current limited regulatory framework, many new technologies can only be used in conjunction with, rather than as a replacement for, manual inspections required by existing Federal Railroad Administration (FRA) regulations. Railroads can sometimes obtain a temporary FRA waiver from existing regulations, but that process is often cumbersome and uncertain. These regulations discourage investment in innovative technologies.

Because automation in the rail industry is new and unfamiliar, regulators will be pressured to identify and resolve every possible risk before allowing testing or early deployment. That pressure must be resisted because hesitation will come at a cost to safety. DOT recognized this in the context of autonomous vehicles in AV 3.0 when it claimed that “delaying or unduly hampering...testing until all specific risks have been identified or eliminated means delaying the realization of global reductions in risk.”

DOT should realize these safety benefits for rail, as well, by encouraging the early deployment of autonomous or highly automated technology on railroads. Unlocking the many potential benefits of automated technology is just as important for railroads as it is for other transportation modes.

Railroads urge Congress and DOT to adhere to several principles to create a level regulatory framework that realizes the benefits of emerging technologies.

- Limited short-term waivers from existing regulations do not give the industry sufficient confidence to invest in new technologies. Regulatory barriers must be overcome in ways that are more enduring than waivers. For example, Congress could direct DOT to make permanent long-standing waivers whose value has been proven through successful implementation. Additionally, DOT could issue waivers of indefinite duration and provide procedures for the expedited conversion of time-limited waivers to permanent waivers or final rules if equivalent or improved safety has been demonstrated.

- To the greatest extent possible, carriers and equipment manufacturers should be permitted to continue to create voluntary standards for safety technology. No one has a greater stake in the success of new safety technologies than carriers and their suppliers, and market pressures already incentivize them to create and implement safety technologies that work.
- New regulations governing automated operations in the transportation sector should be performance-based rather than prescriptive. This will focus industry attention and effort on the outcome rather than on how that outcome is achieved. Performance standards would give the industry discretion to experiment with new ways to improve safety while still being subject to DOT oversight, which would oversee goal-setting, ensure that measures and data are accurate, and impose sanctions if carriers failed to meet their safety targets. As such, employees, customers, and the public at large would still be fully protected.
- Regulation of automated operations should occur at the federal level to avoid a patchwork of state and local rules that would create confusion and inhibit the deployment of safety technology. State and local laws governing rail safety and operations are already preempted by federal law and regulation, and it is especially critical to the efficient functioning of the national rail network that the principle of a uniform set of national regulations not be undercut by state or local laws targeting autonomous or highly automated technologies.
- As with any new technology, public fear of the unknown is often unfounded but can prove to be a major obstacle. The public can and will read much into what DOT and FRA say or do not say on the issue of automated technologies. We urge DOT and FRA to be supportive of innovation and work to facilitate the realization of the benefits of these technologies.