



Fertilizer Distribution by Rail

Fertilizer Background: Half of all crop yields globally can be attributed to fertilizer use. Fertilizer is a resource-dependent, globally traded commodity, subject to international pressures and geopolitical events. Fertilizer is critical to U.S. food security.

Fertilizer and Rail Transportation: Over sixty percent (60%) of fertilizer moves by rail year-round in the United States. The safe and secure handling and transportation of fertilizer products is a top priority for the fertilizer industry. An efficient and competitive freight rail system is also essential to ensuring that fertilizers are available to U.S. farmers during key application windows.

Many fertilizers are transported by rail carriers in railcars and rail tank cars.¹ Fertilizers are transported:

- a) In a solid form called prill (*e.g.*, urea, ammonia nitrate, calcium nitrate, potassium nitrate);
- b) In a liquid form (*e.g.*, urea ammonium nitrate, ammonium nitrate solution, ammonium polyphosphate solution, aqua ammonia); or
- c) As a compressed gas (*e.g.*, anhydrous ammonia)

Some fertilizer products qualify as hazardous materials under U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations, which set forth safety requirements for the transportation of these products. The type of railcar used by the fertilizer industry is dependent on the product being transported and applicable PHMSA requirements.

Ammonia, which PHMSA identifies as a hazardous material, is the building block required to produce all nitrogen fertilizers and most phosphate fertilizers. Beyond fertilizer, ammonia-based products have several important industrial applications, such as Diesel Exhaust Fluid (DEF) for trucks and emissions abatement at power plants. Ammonia also has an important role to play in accelerating a clean energy economy with its potential as a low-carbon fuel.

Railroads are a Critical Transportation Mode: Fertilizers can be transported by train, pipeline, inland waterway barges, oceangoing sea vessels, and, particularly for short distances, trucks. Where pipelines and waterway transportation is not available, trains may be the only way to ship these products long distances from certain locations. Trains are often one of the most efficient

¹ Rail tank cars are nearly 100% owned, leased, and maintained by shippers. A single rail tank car is equivalent to four cargo tank trucks.



ways to ship essential commodities, such as fertilizers, long distances. On average, freight railroads are three to four times more fuel efficient than trucks.² According to the Association of American Railroads, rail carriers “have approximately 10% of the hazmat accidents trucks have.” And “more than 99.9% of all hazmat moved by rail reaches its destination without a release caused by a train accident.”³

A single rail tank car is equivalent to four tank trucks. Trucks are used, but typically for shorter distances, especially for the last miles of a journey to agricultural retail facilities and farms. Trucks are essential for fertilizer transportation, but they are not ideal for long distances because they are less efficient than other transportation modes and, if used over long distances, add significantly to roadway congestion alongside existing vehicle traffic, which can cause safety and logistics challenges.

Safe Distribution of Fertilizer Products: Safety is paramount to TFI and its members throughout the fertilizer supply chain. Transportation incidents involving hazardous materials are rare but can happen, which is why TFI and its members work both to prevent and to enable local responders to prepare for and mitigate any incidents. Federal Railroad Administration (FRA) data indicates that rail accidents have gone down 30% since 2000. Mainline accident per million mainline train-miles have dropped 44% since 2000 and 6% since 2021.

From 2009 through 2017, TFI and its members actively engaged with government and industry partners through the Advanced Tank Car Collaborative Research Program ([ATCCRP](#)) in the research and development of new anhydrous ammonia TIH tank car standards to further enhance the safety of transporting hazardous materials by rail. Following extensive research,⁴ the fertilizer industry is investing millions of dollars to integrate new ammonia tank cars (DOT 112H500 tank car) into the industry’s fleet. Compared to older ammonia tank cars, DOT 112H500 tank cars are a more robust rail car that can better withstand transportation incidents such as derailments.

Additionally, TFI is a sponsor of Transportation Community Awareness and Emergency Response ([TRANSCAER](#)), a nationwide outreach program that helps communities prepare for and respond to hazardous material transportation incidents. Since 2011, TFI and its members, through TRANSCAER, have provided hundreds of training tours and distributed additional information throughout the United States, training more than 200,000 first responders.

² Association of American Railroads: <https://www.aar.org/wp-content/uploads/2020/06/AAR-Sustainability-Fact-Sheet.pdf>

³ Association of American Railroads: <https://www.aar.org/wp-content/uploads/2020/10/AAR-Hazmat-Fact-Sheet.pdf>

⁴ <https://railroads.dot.gov/elibrary/advanced-tank-car-collaborative-research-program-atccrp>



Existing Government Oversight: Transport by rail is regulated by two agencies under DOT: the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Federal Railroad Administration (FRA). PHMSA and FRA regulations are designed to:

1. Prevent derailments;
2. Mitigate or limit the potential safety impacts if a derailment does occur; and
3. Facilitate effective emergency response in the event of a derailment.

PHMSA regulations focus on the offering for transportation and transportation of hazardous materials ([see definition of a “hazardous material” at 49 CFR Section 171.8](#)). FRA regulations broadly establish operational rail-safety requirements that are not specific to hazardous materials, such as track safety, railcar safety, drug and alcohol testing, conductor qualification, and operating requirements. PHMSA and FRA regulations set forth:

- Inspection protocols (for rail tracks and tank cars) to ensure proper functioning of equipment;
- Labeling, marking, placarding, and shipping-paper requirements to communicate potential hazards and identify hazard responses to railroads, emergency responders, and the public;
- Packaging and tank car standards, continuing qualification, and maintenance;
- Directives for rail carriers to maintain safety and security plans that include ongoing analyses of rail routes used to transport certain materials;
- Requirements for rail carriers transporting certain types and quantities of hazardous materials to select routes for this traffic that pose the least overall safety and security risk;
- Requirements and directions for sharing essential information with emergency responders;
- Instructions for handling railcars containing hazardous materials and positioning them on a train to mitigate risk; and
- Standards for the safe operation of freight trains (such as speed restrictions for certain trains), among many other requirements.

FRA enforces the PHMSA hazardous material regulations when transport is by rail.

Responsibilities for Safe Rail Transport: Transportation safety is a shared responsibility with stakeholders having these specific responsibilities:

- a) Shippers who offer hazardous materials for transportation – perform required pre-transportation functions ([see definition at 49 CFR Section 171.8](#)), which include properly classifying a material as hazardous, marking and placarding shipments, selecting and



- inspecting railcars and other packagings that comply with PHMSA requirements for the hazardous material, and securing closures on tank cars and packages, to ensure the railroad is receiving hazardous materials that are properly prepared for shipment;
- b) Carriers – maintain rail infrastructure and transport, handle, store and provide security measures for rail cars in accordance with requirements intended to minimize the risk of accident or harm to the environment; and,
 - c) Tank car and packaging manufacturers and maintainers – construct or maintain tank cars and packages carrying hazardous materials in accordance with certain safety specifications intended to mitigate safety risks during transportation.
 - d) The Regulator – establish minimum regulatory requirements and enforcement measures that promote safe transport by rail.

When all stakeholders do their part, rail is a safe mode for transporting fertilizers. The fertilizer industry has proudly made a concerted effort to dramatically reduce non-accidental releases (NARs) of anhydrous ammonia, which is down 94% since 2000.⁵

Train Derailments: TFI and its members support the National Transportation Safety Board’s (NTSB’s) work to investigate train derailments and believe it is important for that process to be completed to accurately identify the measures that can be taken to prevent similar incidents from occurring.

Reducing the frequency of derailments is essential to rail safety. Additional focus and investments in derailment prevention—including addressing equipment failures, track issues, and human error (track issues and human factors being the [primary causes of most rail accidents](#))—would promote freight rail transit safety.

What Can Be Done: TFI supports any regulatory and legislative changes that boost freight rail safety while maintaining the viability of rail networks and their critical role to ensure U.S. farmers have the fertilizers they need. Congress should work with DOT to ensure it has the authority it needs to conduct focused research and implementation of targeted initiatives that promote rail safety. In some instances, it may be appropriate to request a study to ascertain feasibility and cost-benefits to ensure there are no unintended consequences that could inadvertently decrease safety or harm the public good; for example, if certain critical commodities are unable to be transported by rail. NTSB’s investigation will also help to provide clarity regarding potential policy modifications to enhance rail safety. In the meantime, the following measures can be considered now.

⁵ NARs are the unintentional release of a hazardous material while in transportation, including loading and unloading while in railroad possession, that is not caused by a derailment, collision, or other rail related accident.



- **Wayside Detectors.** TFI commends the rail industry for its voluntary installation of railcar wayside defect detectors. The standardization of these important detectors appears warranted and a rulemaking to consider minimum standards for detector technology, placement and frequency, and response procedures appears appropriate. The Railroad Safety Advisory Committee (RSAC) has already initiated work on this matter. A rulemaking or request for information should evaluate risk and be performance-based.
- **Support First Responders.** Congress should fully fund PHMSA's Hazardous Materials Grants Program. The fee structure for the grant program currently only raises \$23.6 million for the recently revised authorization level of \$46.8 million, set by the Infrastructure Investment and Jobs Act. TFI encourages Congress to revise the current \$3,000 statutory fee limit with a two-tiered limit of \$500 for small businesses and \$5,000 for larger businesses. This approach would provide flexibility to nearly double funding for emergency response training programs.
- **Rail Track and Tank Car Performance.** Fertilizer shippers will continue to invest and upgrade their rail car fleets where improved safety options are proven. Rail carriers should also continue to invest in their networks and technology to strengthen track maintenance and network safety.