

TRAILERS 101

Everything you ever wanted to know about semi-trailers.



Premier[®]
TRAILER LEASING



Introduction	3
Types of Trailers	4-9
Trailer Maintenance Tips.....	10-11
Trailer Tech.....	12
Truck and Trailer Transport Regulations	13
Rent? Lease? or Own?.....	14
Trailer Trends and the Road Ahead	15
Trailer Jargon.....	16
Contact Information.....	17

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Carrying everything from apples to clothing, rolling along interstates and superhighways connecting the Atlantic to the Pacific oceans, or sitting outside of a facility loaded with inventory, trailers - dry, refrigerated, or a mere chassis on wheels - are at the heart of our complex, global supply chain.

Semi-trailers are the primary tool of intermodalism and a key ingredient in supply chain logistics and truck transport. Their loads are interchangeable with different shippers and carriers and enable the movement of a wide variety of cargo. Yet, thanks to their relative simplicity, they are often overlooked. This Trailers 101 guide is here to change that.

Whether you manage a private fleet, operate a trucking company, or sit behind the wheel of a tractor-trailer most of the day, this guide will give you a crash course on everything you need to know on the topic of semi-trailers. We hope you find this guide helpful, share it with your team and reach out to us if we can help.

Your Premier Team



TYPES OF TRAILERS

What's a semi-trailer anyway?

If you thought of semi-trailers as a simple attachment to the back of a truck, you may be surprised to find that there is an astounding array of types of them out there for a sheer unlimited amount of uses. In this guide we will focus on the most common ones, frequently used by shippers and carriers today.



Dry Vans

Dry vans are, as their name implies, trailers with a dry box, carrying many diverse types of cargo. They protect the load from the elements and keep it locked to protect against loss, theft, and other damage. Dry vans vary in length from 28 feet to 57 feet, may have swing or roll up doors and can be made ready for intermodal transport via marine or rail. Dry vans make up most semi-trailers out on the roads. They may be equipped with air suspension (as opposed to spring-ride technology) to ensure a smoother ride and protect your cargo in transit.

Since dry vans often carry valuable goods and almost always depend on adhering to a tightly orchestrated schedule, they are commonly outfitted with technology and features that allow remote tracking. GPS tracking, geofencing (geofencing utilizes GPS technology to form a virtual geographic boundary and triggers a response when the mounted leaves or enters a specified area), and other remote monitoring enables shippers and fleet operators to see into their operations and monitor mileage trends, battery levels, and other parameters.

Within the van itself, dry vans may be outfitted with cargo sensing technology which may scan an entire 57' trailer accurately. It can identify idle trailers that need to be unloaded or identify empty idle trailers ready for reassignment from anywhere. More on the tech behind dry vans in our technology section.



“Trailer suspension is generally one of two types: Spring ride or air ride. Spring ride suspension is constructed of multiple layers of flexible steel strips in one assembly or pack. This configuration provides suspension and cushioning for the trailer. Air suspension utilizes pneumatic air bags that raise the trailer chassis. The air bags raise the trailer chassis above the axle, keeping cargo stable during transit, which is why Premier trailers are equipped with them.”

- Derek Shawen, Vice President, National Account Operations and Special Projects at Premier Trailer Leasing



Refrigerated Vans

Refrigerated vans, commonly referred to as “reefers,” primarily carry temperature-controlled cargo and assist cold chain operations but can also be used to keep goods from freezing during the cold winter months. Refrigerated vans have a refrigeration unit affixed to the trailer and are closely monitored with temperature sensors to ensure that the desired temperature requirements are properly maintained. Due to the insulation thickness in the sidewalls, floors and roof, reefers have slightly less cubic capacity than dry vans.

Refrigerated vans are often constructed with air chutes which eliminate any hot spots within the trailer to protect the cargo and curtail and damage from areas that are warmer and could damage cargo.

Monitoring is key when using reefers. Real-time temperature monitoring and two-way temperature control enables remote access to the equipment. Users are immediately alerted of any low fuel levels or mechanical failures within the refrigeration system, and also have the ability to correct common input errors associated with incorrect set points and operating models, to ensure proper temperature compliance for the length of the load.

Modern reefers can be equipped with solar panels which provide trickle charge to the main battery to reduce battery failures and downtime.



“To accurately monitor and manage our customer’s fleet anytime, anywhere, and stay in constant control of cold chain operations, reefers from Premier are all equipped with innovative technology.”

– Ben Polk, Telematics Manager at Premier Trailer Leasing



Reefer and Dry Van Lift Gates

Both refrigerated and dry vans may be equipped with a lift gate which hydraulically lifts cargo from the ground to the floor level of the trailer when ground deliveries are the only option. While platform sizes and lifting capacities can vary, larger platforms can accommodate 2 pallets and handle loads of up to 6,500 lb - about the weight of an elephant!

Lift gates can expedite loading and unloading of cargo, where loading docks are not reliably available, which makes them an important trailer feature to consider.



Flatbed Trailers

As the name indicates, a flatbed trailer has a flat hauling platform open to the atmosphere, that generally accommodates the transportation of large and heavy oversized cargo that wouldn't fit in a dry van, or has a heavier load that a dry can couldn't structurally support. It is versatile as cargo may be loaded from the top, sides, and rear. Cargo is required to be strapped down with the use of cargo straps and/or chains and binders. Some loads can be exposed to the weather elements while others may need to be covered with tarp to protect the load.

Flatbeds come in a variety of lengths and models, capable of handling many diverse types of cargo from machinery, steel coils, construction equipment, and most anything that may be safely stowed and transported within the weight limitation of the flatbed trailer.

DID YOU KNOW?

Strapping, tarps, and durable covers are typically not provided with a leased or rented trailer. Shipper or carriers usually provides these for safety and protection of the cargo.



Chassis Trailers

Chassis trailers consist of a metal frame on wheels designed and used to securely carry shipping containers. They allow for containers to be loaded from ship or the marine terminal yard directly to the chassis and delivered to another destination for further transport or off-loading. Chassis come in a variety of lengths and models to accommodate the various sizes and weight of the shipping containers.



TRAILER MAINTENANCE TIPS

Keeping Trailers on the Road

Because truck trailers are in constant use, carry heavy loads, transit through all types of weather and environmental conditions, and have additional equipment such as lift gates installed on them, they require thorough and disciplined maintenance. Maintenance keeps trailers performing well and enables them to be operational and useful when you most need them in today's busy supply chain environment. The last thing you want after all, is a trailer to break down on the highway.

Maintenance, however, can be complex. Managing it requires skill, discipline, and smart management. It may be periodic or scheduled, or it may be performed when needed. Maintenance also may be performed when the material condition of the trailer, or its equipment fails, or is not performing well.

To gain the best insight into maintenance, let's look at the different types and how they are used in keeping trailers operational, while ensuring a long and productive lifecycle

Planned Maintenance

As its name implies, planned maintenance is planned. It is usually scheduled and occurs at some periodicity – reefers for example get an A inspection after 1500 hours and a B inspection after 3000 hours. Planned maintenance may be developed from historical records, manufacturer's recommendations, or overall experience of the operation of a specific trailer in its common environment.

Predictive Maintenance

Predictive maintenance is based on historical assessment of equipment failures and is scheduled well before a failure is likely. It may be time-based (replace brake pads every 100,000miles) or condition based (replace brake pads after ¼ inches of remaining lining).

In condition-based maintenance, an inspection may be performed, as a maintenance action, and then because of such inspection or test, further maintenance may be performed on the trailer.

For example, a chassis may be inspected thoroughly for corrosion, cracks, or degradation every 12 months. If any adverse conditions are found, they may then be corrected then, or their correction may be planned and scheduled on a later date.

Corrective Maintenance

Corrective maintenance is, as its name implies, maintenance that corrects a defective condition. It is not always planned and may only take place when needed, based on a time-based schedule or condition-based schedule. Or it may only be performed after inspection, and it is determined to need to be recoated or touched up. Corrective maintenance would replace parts at some time interval, no matter the condition.

Types of Maintenance Options

When leasing trailers, you may choose to perform maintenance yourself or turn over all maintenance to the lessor or another third party. There are several different types of maintenance options available to a lessee.

Mileage Maintenance - This option is based on a mileage interval. When a certain mileage level is reached, the maintenance is performed. If a trailer is leased, you may pay a mileage fee and your leasing partner handles regular inspections for you.

Net Trailer Maintenance - In a net trailer maintenance option, a lessee returns a trailer to a lessor in the same condition it received it in when their term of operation began. All damages and items needing replacement, including normal wear items, are the responsibility of the lessee.

TRAILER TECH

Tire Technology

Tire manufacturers continue to develop high performing tires with better materials and tire construction. In addition, tires are now made for trailers that are “intelligent.” Tires may have sensors built within them that allow different parameters to be communicated to a remote location or platform, indicating a tire’s pressure, temperature, and speed, often in real-time. This allows operators to know the risk of tires based on indications in real-time and take necessary precautions when such notifications occur.

Tires are also constructed in ways that provide less friction and resistance to enable less “work” for a given unit of power. Such modern tires are called low-rolling-resistance tires and help operators achieve better fuel efficiency.

Tire technology is a complex and comprehensive subject. Many professionals dedicate their lifelong careers to tire design and servicing. From the perspective of trailers, tire technology has become more sophisticated and plays a key role in the efficient and safe operations of trailers of all types in serving all supply chain operations.

Brake Technology

Like tires, brake technology is also complex, but critical, in the safe operation of trailers. Typically, trailers use air brakes activated by the operator and synced with the truck tractor. The applied friction of a brake pad on a wheel disc drum is activated with compressed air that pushes against a piston that applies very high pressure to the wheel via the brake pad.

Corrosion and Coatings Integrity

Trailer corrosion and coatings are also quite sophisticated and complex. Chassis and trailer components are coated with high performing coatings using different methods of application. Several coats of coating, measured in mils, may coat over a prime coat which is applied directly to the chassis - which is often constructed from steel or aluminum.

This coating serves to protect the underlying metal, prevent corrosion, and further degradation. In the case of a steel chassis, exposed steel, if uncoated will oxidize and rust in short order. Even when coated, wear and tear on the trailer chassis will cause coatings to chip and wear and cause further oxidation and rust. If no inspection or maintenance is performed on coatings, the degradation may approach a point that is unsafe and certainly unsightly.

TRUCK AND TRAILER TRANSPORT REGULATIONS

Know the Rules

The U.S. Department of Transportation is principally concerned with the comprehensive safety of transportation within the United States. It is an agency of the federal government and agencies within it regulate truck transport as well as trailers,

The Federal Motor Carrier Safety Administration (FMCSA) [<https://www.fmcsa.dot.gov/>] operates within the Department of Transportation and is the specific administration that, in part, regulates truck and trailer safety. FMCSA is the lead federal government agency responsible for regulating and providing safety oversight of commercial motor vehicles (CMVs). It was established as a separate administration within the U.S. Department of Transportation (DOT) in 2000.

FMCSA regulations govern trucks as well as trailers. These regulations are involved and complex. Trailers and their equipment are subject to various regulations and may be found online at <https://www.fmcsa.dot.gov/regulations>.

There are nearly 100 different sections of regulations. Some key regulator areas include employee safety and health standards, regulations regarding safety inspections (<https://www.fmcsa.dot.gov/regulations/title49/section/396.17>), and certifications for drivers (<https://www.fmcsa.dot.gov/regulations/title49/part/3830>).

The Federal Highway Administration (FHWA) [<https://highways.dot.gov/>] is also an agency within the U.S. Department of Transportation that supports state and local governments, in the design, construction, and maintenance, of the nation's highway system and various federally and tribal owned lands.

Because it focuses on highways and roadways, it also regulates different facets of allowable truck and trailer configurations allowable on different roadways. The administration imposes regulations and parameters such as lengths allowed in different states as well as different configurations of trailers and trucks within those states. This includes double trailers, semi-trailers with specific classes of truck tractors, and many more things.

FHWA regulations are also comprehensive and complex and may be consulted for various requirements at https://ops.fhwa.dot.gov/freight/publications/size_regs_final_rpt/index.htm#cmv

Other agencies within the federal government also have a hand to a lesser extent in the regulation of truck transport and the trailers they pull.

For example, the **Food Safety Modernization Act (FSMA)** [<https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/food-safety-modernization-act-fsma>] is under the authority of the U.S. Food and Drug Administration (FDA) and governs different requirements for carriers in the conveyance of food products. Because food products and perishable goods are commonly transported via dry and refrigerated vans, different requirements regarding such cargo are imposed by the FSMA to ensure food safety and compliance with hygiene and food safety standards.

RENT? LEASE? OR OWN?

The decision to rent, lease, or own semi-trailers is contingent on many factors. Such factors center around the needs of a carrier or shipper. There are various scenarios where renting, leasing, and ownership make the most sense for an entire fleet, or for a portion of a fleet. The decision is one that needs to be made with careful consideration of numerous factors.

Ownership may offer the lowest overall cost and highest cash flow, but with some caveats. Such ownership requires the owner take possession for a longer time period. If they no longer need the trailer, they still bear the burden of ownership.

Leasing a trailer helps to reduce the cost of utilizing it for a longer time period. For shorter duration, trailer users may consider renting trailers. When a trailer is rented it may be for a term such as a week, month, or other short duration. However, when a trailer is needed for longer durations, renting is not as economically favorable as a longer-term lease.

Leasing new trailers also allows upgrades to a fleet and enables cargo to be carried with the most advanced trailer technology. Leasing is also an important consideration, given changes in capacity demand and the risk involved in both ownership and renting. Plus, as trailers age, keeping the reliability high when servicing customers is crucial, giving more weight to the decision to lease.

Again, the decision is best made with consideration to many varied factors. Those who use the trailer must consider their necessary transportation environment, the demand for trailer's service, and the necessary reliability and maintenance requirements required in utilizing the trailer.

COMPARE THE ADVANTAGES OF OWNING, LEASING AND RENTING

	OWN	LEASE	RENT
Add trailers immediately to match fluctuating freight volume	●	●	●
Get just the right number and type of trailers	●	●	●
Quickly dispose of trailers you no longer need	●	●	●
Conserve capital by reducing upfront cash outlay	●	●	●
Reduce the risk of obsolescence and increased maintenance	●	●	●
Have the latest in trailer technology and design improvements	●	●	●
Include trailer maintenance and emergency roadside service	●	●	●
Get a deduction for monthly payments	●	●	●
Deduct the depreciation of the asset	●	●	●

● Yes ● No



TRAILER TRENDS AND THE ROAD AHEAD FOR SUPPLY CHAIN MANAGEMENT

In the past, supply chain logistics seldom made front page news. However, in times of the supply chain crunch we frequently hear about the topic and have come to realize its critical importance to our everyday life. Whether you manager a private fleet, operate a small trucking business or drive a semi-truck yourself, developing a sound trailer strategy that ensures fast turn-around times and overall reduction of downtime will be a key ingredient of success. It will be up to logistics professionals and trucking experts alike, to better understand the intricacies of a well-rounded semi-trailer strategy and leverage the latest technology to execute it.

TRAILER JARGON

Glossary of Terms

Carrier - The mover transporting your household goods.

Chassis - A trailer-type device with wheels constructed to accommodate containers, which are lifted on and off.

Condition-based Maintenance - Maintenance performed on material or equipment based on an underlying condition caused by continuous wear and operation.

Drayage - Transporting of rail or ocean freight by truck to an intermediate or final destination; typically, a charge for pickup/delivery of goods moving short distances (e.g., from marine terminal to warehouse).

Dry Van - a trailer that is not refrigerated and normally enclosed, often carrying dry goods.

Geofencing - a method of controlling the flow of transportation and supply chain cargo with the GPS, sometimes RFID technology to create a virtual geographic boundary. Software may be programmed to trigger a response when a mobile device enters or leaves a particular area.

Heavy Duty Truck - A classification of truck with a higher gross vehicle weight exceeding 19,500 lb. Class 6 - 8 trucks are considered heavy duty trucks.

Less-Than-Containerload/Less-Than-Truckload (LCL/LTL) - A container or trailer loaded with cargo from more than one shipper; loads that do not by themselves meet the container load or truckload requirements.

Lift Gate - Hydraulic or electric (or both) equipment on the rear of a truck used to lift, load, and unload heavy cargo. The gate assembly is rated by the gross weight it is capable of lifting.

Low Boy - A trailer with a high-capacity rating and a detachable gooseneck, often used for hauling heavy machinery or equipment.

Predictive maintenance - A maintenance technique assessing material and equipment, understanding critical points of failure or degradation, and estimating reasonable times to perform maintenance to avoid failure.

Leasing Agreement - In the context of trailers, leasing is for terms longer than renting, with terms that fit the longer time duration. Leasing affords use of the trailer without the burden of ownership and provides flexibility to the user if the need diminishes or ends over time, or if the trailer technology becomes obsolete for the user's needs.

Reefer Trailer - A refrigerated trailer that is commonly used for perishable goods.

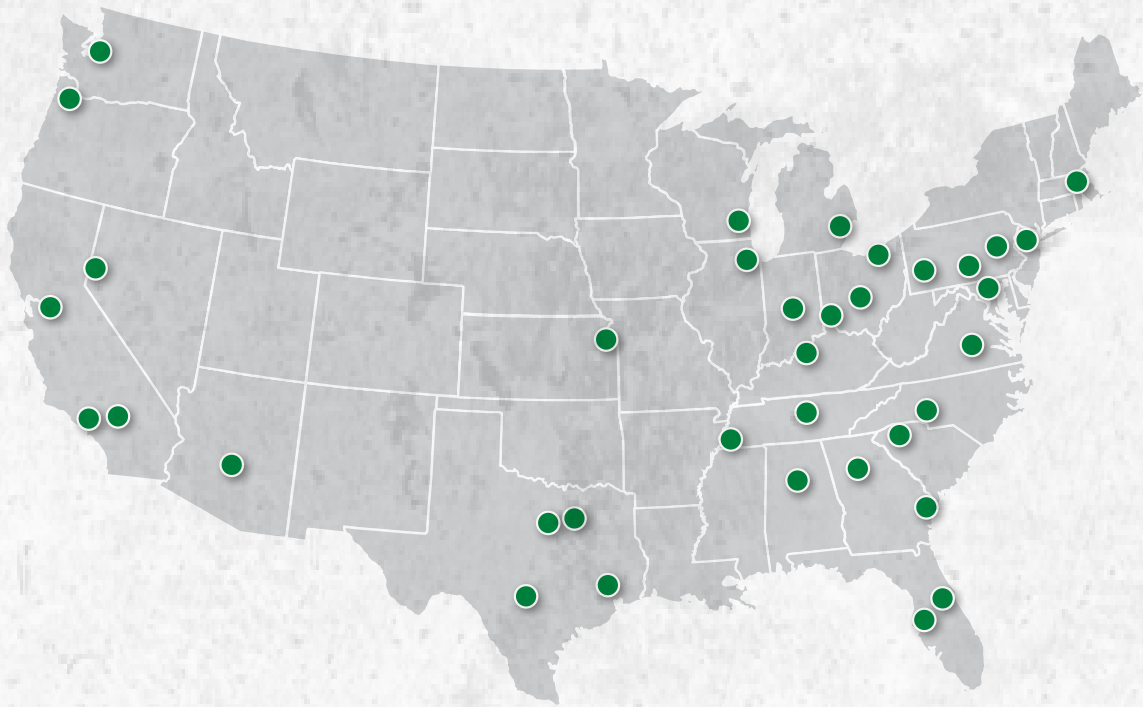
Rental Agreement - In the context of trailers, rental agreements are for shorter durations than leases. Renting provides maximum flexibility to meet the needs of the renter. Renting agreements for trailers are better for shorter term needs or seasonal needs, without a continuous need for the trailer over time.

Radio Frequency Identification (RFID) Tags - physical devices, mounted on a cargo load that uses radio frequency technology with these tags and tag readers that provides an identity of the cargo.

Shipper - The person (customer) whose goods are being moved.

Truckload (TL) - Quantity of freight equals a fully loaded trailer, or at a minimum, the amount required to qualify for a truckload rate. TL at its essence means that a fully loaded trailer transports goods from point A to point B without any additional stops.

Twenty-foot Equivalent Unit (TEU) - The 8-foot by 8-foot by 20-foot intermodal container is used as a basic measure in many statistics and is the standard measure used for containerized cargo.



Want to learn more about trailers
or need a hand?
Visit **PremierTrailerLeasing.com**
or send an email to
trailers@premiertrailerleasing.com.

