UNDERSTANDING
BRIDGE WEIGHT
RESTRICTIONS
Connecting You With Texas
This guide explains bridge weight restriction information, signage, and provides additional resources for those in the trucking industry and law enforcement.

**Why are bridge weight restrictions important?**

Distributing a vehicle’s weight across more axles and having more distance between axles and axle groups, spreads weight across more of a bridge. This helps prevent damage to Texas bridges and reduces possible early replacement costs. By following information in this guide you are doing your part to ensure Texas bridges stay in good condition for travelers and commercial trucking.

The example below illustrates optimal and less than optimal length-to-weight ratios (long trucks vs short trucks).

**Optimal**
Weight-to-Length ratio

With a **longer truck**, the weight is spread out over a greater distance which helps prevent damage to the bridge.

**Less than Optimal**
Weight-to-Length ratio

With a **shorter truck**, the weight is concentrated into a shorter distance which can cause damage to the bridge.
Bridge Lifespan Information

Bridges are designed and built to last many years under good conditions. Older bridges often need weight restrictions to help prevent damage since they were designed to accommodate commercial trucks that were much lighter, when compared to today’s modern commercial vehicles. All vehicles, from commercial trucks to emergency vehicles to passenger cars must follow bridge weight restrictions.

A bridge’s life span is mostly invisible to drivers. Everyday stress, exposure to inclement weather, and weights over restricted limits reduce a bridge’s lifespan.

Bridges are routinely inspected and assessed. Part of the assessment is determining their safe load carrying capacity. To help bridges last as long as possible, weight restrictions are posted when necessary. When drivers follow weight restrictions it prevents damage to the bridge and costly repairs or replacement. Violating bridge weight restrictions can result in expensive citations, decrease of a bridge’s lifespan, and the risk of collapsing a bridge in extreme cases.

Pavement Lifespan Information

Pavement life is also shortened by overweight vehicles. A pavement that is subjected to high axle loads will develop cracks and rutting far sooner than expected. The road may require more frequent resurfacing, crack seal and other maintenance. It will need a full rebuild or replacement sooner than its intended design life. Therefore, limits are placed on single and tandem axle loads in consideration of pavements as well as bridges. Keeping axle loads well below the prescribed limits helps to prolong pavement life as well as bridge life.
**Terminology**

It’s important to understand the terminology used on weight restriction signs because it is used to show what vehicles or axle configurations the restrictions apply to.

**Single Axle**
- also referred to as Axle
- • 20,000 pound maximum (without permit)

**Tandem Axle**
- also referred to as Tandem
- • 34,000 pound maximum (without permit)

Note: Per the Texas Transportation Code, a Tandem Axle is defined as: “two or more consecutive axles spaced 40 inches and not more than 96 inches apart”. For most instances, this will be the common 2-axle configuration.
**Terminology (Continued)**

**Single Veh (Vehicle)**
also referred to as **Single Unit**
These vehicle types are a truck **without a trailer**.

- Delivery truck
  also referred to as a box truck
- Garbage Truck
  2 – 7 axles
- Dump Truck
  2 – 7 axles
- Emergency Vehicles (fire engines)
  2 axles
- Emergency Vehicles (fire engines)
  3 axles

**Combination Vehicle**
also referred to as **Tractor-Trailer**
or **18-wheeler**

- 3 – 5 Axles
Terminology (Continued)

**Gross Weight**
Refers to a vehicle’s entire weight from the front end to rear end.
- It includes the weight of all of the vehicle’s axles
- It applies to:
  - passenger cars
  - pickup trucks
  - 18-wheelers, dump trucks
  - any vehicle

Gross weight limits vary based on the type of vehicle. In addition to gross weight limits, all vehicles must follow axle weight limits.
How to read Texas-specific signs?

This standard sign (at right) indicates two restrictions that apply to one bridge:

1. A **gross weight** limit of 24,000 pounds
2. A **single axle** or **tandem axle** limit of 10,000 pounds.

Notes:

- All vehicles must follow both gross weight and axle restrictions listed above.
- Each single axle cannot exceed the 10,000 limit.
- Each tandem axle cannot exceed the 10,000 limit.

Similar to the sign above, this standard sign has four restrictions that apply to one bridge.

<table>
<thead>
<tr>
<th>WEIGHT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS 24,000 LBS</td>
</tr>
<tr>
<td>AXLE OR TANDEM 10,000 LBS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE AXLE 20,000 LBS</td>
</tr>
<tr>
<td>TANDEM AXLE 34,000 LBS</td>
</tr>
<tr>
<td>SINGLE VEHICLE 69,000 LBS</td>
</tr>
<tr>
<td>COMBINATION VEHICLE 80,000 LBS</td>
</tr>
</tbody>
</table>

Sample Sign
How to read Texas-specific signs? (Continued)
Both the gross weight and the axle weight restrictions must be followed.

### Commercial Trucks
Must follow both the gross weight limit and the axle weight limit.

<table>
<thead>
<tr>
<th>GROSS WEIGHT</th>
<th>PER AXLE WEIGHT LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS 20,000 LBS</td>
<td>Tandem Axle</td>
</tr>
<tr>
<td>AXLE OR TANDEM 9,000 LBS</td>
<td>Tandem Axle also known as steering axle</td>
</tr>
</tbody>
</table>

### Passenger Vehicles
Must follow both the gross weight limit and the axle weight limit.

Since most passenger vehicles can’t carry large weights like commercial trucks, they are generally only focused on the gross weight portion of the sign.
How to read Texas-specific signs? (Continued)

Both the gross weight and the axle weight restrictions must be followed.

This truck passed because it was at or under both gross weight and axle weight limits.

This truck passed because it was at or under both gross weight and axle weight limits.
How to read Texas-specific signs? (Continued)

Both the gross weight and the axle weight restrictions must be followed.

This truck failed because it was over the gross weight limit.

This truck failed because it was over both gross weight and axle weight limits.
How to read Texas-specific signs? (Continued)
Both the gross weight and the axle weight restrictions must be followed.

**WEIGHT LIMIT**

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>Weight Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE AXLE</td>
<td>20,000 LBS</td>
</tr>
<tr>
<td>TANDEM AXLE</td>
<td>34,000 LBS</td>
</tr>
<tr>
<td>SINGLE VEHICLE</td>
<td>69,000 LBS</td>
</tr>
<tr>
<td>COMBINATION VEHICLE</td>
<td>80,000 LBS</td>
</tr>
</tbody>
</table>

Sample Sign

This combination vehicle must follow:
- Single axle
- Tandem Axle
- Combination Vehicle

This single unit vehicle must follow:
- Single axle
- Tandem Axle
- Single Vehicle
How to read Texas-specific signs? (Continued)

Does this sign apply

**YES**

<table>
<thead>
<tr>
<th>WEIGHT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE VEH</td>
</tr>
<tr>
<td>5–7 AXLES</td>
</tr>
<tr>
<td>##,#### LBS</td>
</tr>
</tbody>
</table>

Truck doesn’t have the minimum number of axles listed on sign.

Truck doesn’t have the minimum number of axles listed on sign.

Truck is not a single vehicle.

**NO**
How to read Texas-specific signs? (Continued)

Both the gross weight and the axle weight restrictions must be followed.

This emergency vehicle must follow:
- Single Axle
- Tandem Axle
- Gross Weight

<table>
<thead>
<tr>
<th>EMERGENCY VEHICLE WEIGHT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXLE</td>
</tr>
<tr>
<td>TANDEM</td>
</tr>
<tr>
<td>GROSS</td>
</tr>
</tbody>
</table>

Note: Emergency Vehicle Weight Limit signs are always stand-alone signs. If a bridge has other weight restriction in addition to restrictions for the Emergency Vehicles, they will always be on separate signs. The “FAST Act”, signed into law in 2015, had a provision that allows for the much heavier axle and gross weights of this specific class of vehicle.
Resources

Department of Motor Vehicles

Federal Highway Administration Bridge Formula

Texas Department of Transportation Bridge Information
General Bridge Information
https://www.txdot.gov/inside-txdot/division/bridge.html

Load Restricted Bridge Map
http://apps.dot.state.tx.us/apps/gis/lrbm/

Texas Transportation Code
Chapter 621. General Provisions Related to Vehicle Size and Weight

Chapter 622. Special Provisions and Exceptions for Oversize or Overweight Vehicles

Chapter 623. Permits For Oversize or Overweight Vehicles
Glossary

Axle
Refers to a single axle on a vehicle (as opposed to a tandem, tridem, etc.) This could be the front steering axle, a single axle on the back of a tractor (where you might instead see a tandem some times), AKA “Single Axle”.

Combination Veh or Combination Vehicle
This is typically a truck pulling a trailer, like a tractor-trailer combination. It could be an 18-wheeler, a 10-wheeler (all axles have single tires and not dual wheels or dualies), or a tractor pulling two or more trailers.

Emergency Vehicle
Refers to 2-axle and 3-axle fire engines that typically exceed the usual legal maximum Single and Tandem Axle weights. These are a special class of vehicles with higher allowable legal weights.

Gross or Gross Weight
Refers to the entire weight of any vehicle or a vehicle and trailer combination of any style. A gross weight would be the sum of all the axle weights regardless of whether they are single, tandem, their spacing, or their number.

Legal Weights
This is established by Texas Law. There are limits for axle weights and gross vehicle weights which cannot be exceeded without being permitted. Trucks meeting the Legal Weight requirement for axles and gross weights are allowed to travel anywhere in Texas without a permit but are required to obey weight restriction signs and must meet the following:

- Single Axle – 20,000 LBS
- Tandem Axle – 34,000 LBS
- Single Vehicle/Single Unit – Varies by configuration. Vehicles must obey the above listed Single Axle and Tandem Axle limits. The most a Single Vehicle with two single axles can weigh, or its gross limit, is 2 times the 20,000 LBS Single Axle limit, or 40,000 LBS. The most that a Single Vehicle with three Axles can weigh is the total of the Single Axle and Tandem Axle limits – 20,000 LBS plus 34,000 LBS or 54,000 LBS. Beyond that are limits for the newer vehicles with 4 or more axles, up to 7 axles total. The axles above the 3-axle total for “typical” Single Vehicles or Single Units are special Single Axles referred to as Lift Axles. The maximum allowed weight on those axles is lower than a regular Single Axle and is 8,000 LBS. Gross weight restrictions for these vehicles are:
  - 4 Axles – 54,000 LBS | 5 Axles – 62,000 LBS | 6 Axles – 69,500 LBS | 7 Axles – 77,500 LBS
  - Combination Vehicle – 80,000 LBS

1. There are numerous exceptions for what constitutes a “legal truck”. These affects the allowed, non-permitted single axle, tandem axle, and gross vehicle weights. See the Texas Transportation Code - Chapters 621 and 622 for those exceptions.
2. It is rare that a front steering axle on any vehicle will reach the 20,000 LBS limit for a Single Axle. Usually, the steering axle is approximately 1/3 of the weight of the rear Single Axle or rear Tandem Axle. This explains the similarity in maximum legal weights of a 3-axle and 4-axle Single Vehicles or Single Units. It is possible but would rarely be the case that a 3-axle truck would reach the maximum gross restriction of 54,000 LBS.
Glossary (Continued)

**Single Veh or Single Vehicle**

Refers to a vehicle where front and rear portions of a vehicle are on a single frame. This is different from a vehicle pulling a trailer, such as tractor-trailer combination. AKA “Single Unit” (Examples are buses, dump trucks, concrete trucks, passenger vehicles, etc.).

**Tandem**

A 2-axle unit that works together; different than two closely space single axles; AKA “Tandem Axle”. Note, the Texas Transportation Code defines a Tandem as: “A Tandem Axle is defined as two or more consecutive axles spaced 40 inches apart and not more than 96 inches apart.” This definition allows for what is known as “Tridems”, or a 3-axle unit, but also includes the variable spacing of axles that is common on the rear tandem axle on the trailer portion of many tractor-trailers. For the vast majority of users, the term “tandem axle” will concern the typical 2-axle unit that functions as a single support at the back of the tractor, back of a trailer, or the rear, heavy axle of a single unit vehicle like a dump truck.

**X-7 Axles**

Pertains to the range of the total number of axles on a Single Vehicle or Single Unit for which a gross weight restriction is applied. This would typically be a dump truck or similar vehicle with 4 axles or more, up to 7 total. The variable range is: 4-7, 5-7, 6-7, or simply 7 axles. As an example, a sign with a gross weight restriction of 50,000 LBS for a Single Vehicle with 4-7 Axles means vehicles that have 4, 5, 6, or 7 axles must all have a gross weight of 50,000 LBS or less to cross a bridge. If a similar sign lists a restriction of 69,000 LBS for a Single Vehicle with 7 Axles, that means that Single Unit vehicles with 7 axles must have a gross weight of 69,000 LBS or less to cross a bridge. Vehicles with less than 7 axles are not affected by this sign as they should be obeying restrictions for their particular configuration. When counting axles for a Single Unit/Single Vehicle, a tandem axle counts as two axles.