

Manure Application Equipment and Road Use Requirements

Agdex 743-4



Hauling manure on Alberta roads requires operators to pay close attention to highway safety, road infrastructure and the environment. This factsheet discusses manure application equipment and road use requirements. Its purpose is to help farmers and custom manure applicators understand the impacts manure hauling equipment has on roads and bridges and the legal requirements for road access as well as providing tips/suggestions on how to minimize wear and tear on the infrastructure. This factsheet applies to the transportation of an implement of husbandry which by definition means:

- a tractor designed and used for agricultural purposes, or
- a vehicle designed and adapted exclusively for agricultural, horticultural, aquacultural or livestock raising operations.

Manure Hauling Equipment Challenges

The following equipment challenges are faced when hauling manure.

- The size and capacity of manure application equipment has increased over the years in order to improve application and production efficiencies. However, road and bridge infrastructure was not designed and built to handle the weights associated with the new size of equipment.
- Equipment may be using tires that are not rated for road use. These tires, typically referred to as floatation tires, are designed to be used on fields to reduce compaction. Because of the tire design, speed may be limited while operating on a road.

Floatation Tires

Floatation tires are not primarily designed for on road use. Floatation tires typically have their maximum speed marked on the tire, otherwise the tire manufacturer will be able to provide the maximum speed and tire pressure information based on the weight of the vehicle.

- As producers work to improve manure use efficiency there has been an increase of injection and banding of manure. This has resulted in additional application tool bars being added to the back of application tankers. This increases the weight of the equipment, making it harder to meet regulated weights and reducing overall hauling capacity.
- Manure application begins as early as possible in the spring which coincides with the frost coming out the ground. This is when roads are most susceptible to excess wear and tear from heavy equipment.. Spring application improves nutrient use efficiency, allowing producers to get the greatest benefit out of the manure. Alberta has a relatively short growing season and early spring time application increases the available window for manure application. Also there are a limited number of applicators available to spread the manure that needs to be managed.

What does a manure applicator need to know?

All provincial and municipal roads fall under the [Traffic Safety Act](#) and regulations. In particular, the [Vehicle Equipment Regulation](#), [Commercial Vehicle Dimension and Weight Regulation](#) and the [Commercial Vehicle Safety Regulation](#) regulate the transportation of commercial vehicles on Alberta highways. These regulations were put in place to maximize highway safety and minimize the wear and tear impacts from commercial vehicles on transportation infrastructure.

Farm equipment is regulated with respect to height, length, weight, and vehicle configuration but is exempt from width regulations as per section 6 and 7(b) of the Commercial Vehicle Dimension and Weight Regulation. Please see [Safe Transportation of Farm Equipment in Alberta](#) for more information.

Regulated weights

Weights are specified for single, tandem, tridem (triple) and quantum axle groups. Vehicles that exceed regulated weight limits must be operated under an overweight permit issued by Alberta Transportation. To apply for a permit the operator must contact Alberta Transportation Central Permitting Office at 1-800-662-7138. They will assist with the application process. Table 1 shows both maximum regulated weights and permitted overweight limits on municipal and provincial roads.

Axle Type	Provincial Highways Regulated Weights	Municipal Roads Regulated Weights	Permitted Overweight Limits
Single Axle (2 tires)	7,300 kg	7,300 kg	9,100 kg
Single Axle (4 tires)	9,100 kg	9,100 kg	9,100 kg
Tandem Axle Group (< 8 tires)	13,600 kg	13,600 kg	17,000 kg
Tandem Axle Group (8 tires)	17,000 kg	17,000 kg	n/a
Tridem Axle Group (< 12 tires)	19,000 kg	17,000 kg or 53,500 kg GVW *	24,000 kg
Long Spread Tridem (3.0 m to 3.7 m) (12 tires)	24,000 kg	17,000 kg or 53,500 kg GVW *	n/a
Quantum Axle Group (Other than single, tandem or tridem groups) or Quad Axle Group	9,100 to 17,000 kg	17,000 kg or 53,500 kg GVW *	27,000 kg

Maximum weights on municipal roads are restricted to 17,000 kg on a tandem axle group and 53,500 Gross Vehicle Weight (GVW). If the tridem axle vehicle group or GVW of vehicle exceeds these limits the operator is responsible for obtaining an annual TAC permit from Alberta Transportation. Operators are also required to get permission from the municipality.

Table 1. Maximum Weights

For permits call Alberta Transportation Central Permitting Office at 1-800-662-7138. They will assist you with the application process.

Bridges weight restrictions

Bridges are built to carry a certain load or weight. Bridges that were build more than 40 years ago were designed for loads that were almost half of the current design load.

The bridge design load is dependent on several factors including the following:

1. Type of Construction
2. Length of the bridge
3. Span type and continuity
4. Girder type
5. Type of vehicles using the bridge
6. Number of repetitions of a load
7. Bridge Age

The figure below looks at different vehicles to demonstrate the impact that axle configuration and loading makes on the bending of a 10 metre span bridge.

A legally loaded semi-truck at 24,000 kg, with a tridem axle trailer, will have a slightly higher bending effect on the bridge than an overweight permitted manure tanker, with quad axels, at 27,000 kg.

When that same quad axle manure tanker is fully loaded, at 48,000 kg, it would increase the bending effect on the bridge by approximately 50%.

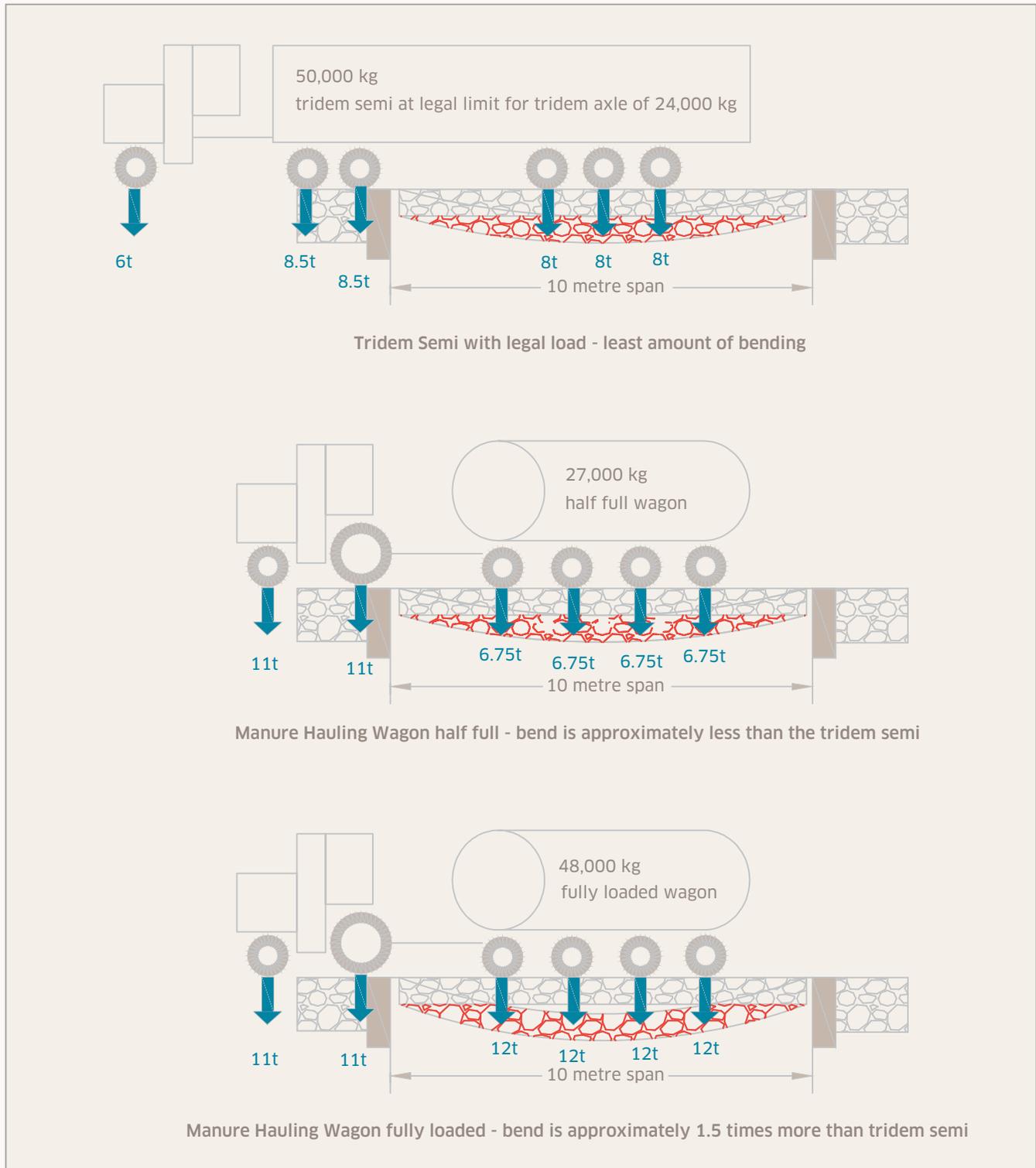


Figure 1. Maximum Bridge Bend Based on Vehicle Loading

Overweight permits

An overweight permit for manure haulers can be obtained from Alberta Transportation. These permits are subject to road bans and bridge restrictions. As well, permission must be obtained from the municipality prior to travel.

Obtaining a permit will provide the operator with a set of conditions under which the vehicle must be operated as well as the maximum allowable weights and restrictions on the equipment used.

A permit costs \$15.

Conditions set out in a permit for a manure spreader include the following.

1. Adequate brakes required on farm tractor and manure spreader trailer.
2. Maximum speed 40 km/hr.
3. Trailer may operate loaded on provincial highway up to maximum weight of
 - 9,100 kg for single axle trailers
 - 17,000 kg for tandem axle trailers
 - 24,000 kg for tridem axle trailers, or
 - 27,000 kg for quad axle trailers
4. No travel on restricted bridges.
5. No travel on banned roads.
6. Amber rotating light required on trailer when operating during darkness.
7. All valves and piping closed to prevent leaking from tanks.
8. Warning triangle required on rear of trailer.
9. Tires shall not exceed loading or speed ratings as per the manufacturer.
10. Tire must be at least 635 millimetres in width.
11. Prior to commencing each haul, the permit holder or driver shall contact the local authority (municipality or province) with the intended route, duration of haul and number of loads to be transported.
12. Any breach of the conditions of this permit will nullify the permit.

Beneficial Management Practices

To minimize the impact on roads and bridges the following beneficial management practices may be considered:

- Consider requesting one-way traffic flow, so heavy machinery can travel down the middle of the road. Avoid travel on the edge of the road whenever possible.
- Pavement damage can be reduced if driving when high pavement temperatures can be avoided. Consider hauling in the early morning to reduce impact from heat on the roads.
- Balance/adjust axle weights to ensure that one of the axles is not carrying the majority of the load since one heavier axle weight would be harder on the road than two lower averaged axle weights.
- For liquid manure consider using dragline manure application systems as a way of moving manure to fields instead of running spreaders on roads.
- Move material from farm to field by transferring loads from a tanker or “nurse truck” on the road to spreaders in the field. This results in lighter loads on the road as the heavy haulers remain in the field.

- Avoid critical times of the year such as:
 - spring thaw when the roads are weak and most susceptible to wear and tear,
 - when roads or subgrade are wet. Wet conditions increase the wear and tear on paved roads and this impact may not be noticeable due to bottom up cracking.

Unfortunately, most of these conditions closely coincide with the narrow spring window when manure storages need emptying and weight restrictions, in the form of Road Bans, are placed on many rural roads. It is important to work with the local municipality and Alberta Transportation to ensure the physical condition of the roads and bridges is maintained.

Potential Fines

Operators failing to comply with the regulation or permit conditions are in violation of the *Traffic Safety Act* and subject to enforcement action and possible prosecution. Fines are substantial and are based on the weight exceeding the permitted allowable load. For example the fully loaded wagon in Figure 1 would receive a fine of \$13,920.

References

[Utilizing Highway Right of Ways and Culverts for Manure Draglines - Agdex 743-3](#)

[Safe Transportation of Farm Equipment in Alberta](#)

[Misapplication of “not for highway service \(NHS\)” Tires](#)

[Rodata Services Ltd.](#) (RDS) provides information on road bans, and all aspects of moving overweight, over dimensional vehicles on roadways throughout Canada.