

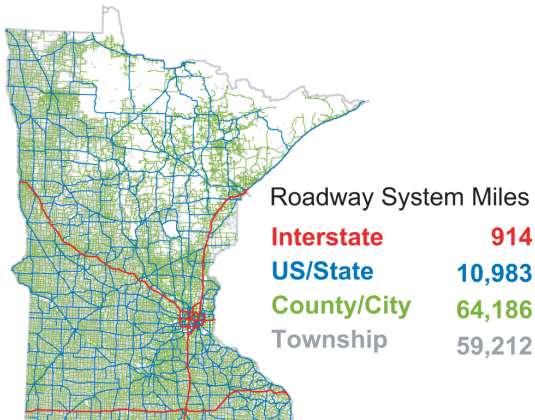
## Why Don't We Build All Roads to Carry Heavier Loads?

If money were not an issue, then building all roads to handle the heaviest legal loads would be the solution to accommodating freight on Minnesota roads.

Our transportation system has developed over the last 100 years. During this time, truck sizes and weights have increased faster than roads have been improved.

When most roads are reconstructed today, they are built to carry 10-ton loads. But, with limited dollars available each year, the focus is on building a balanced system – the most-used roads carrying the heaviest loads need to be built to manage these loads.

Our transportation system is comprised of many types of roads that are managed by varying levels of government. The following map shows how various levels of government work together to provide an effective transportation system.



## Are Load Limits Affected by Weather and Season?

In Minnesota, asphalt and gravel roads are at their weakest in the spring, when the ground begins to thaw and the materials that support the road's surface are saturated.



In order to account for their weakened state, some asphalt and gravel roads are restricted in the spring, this means that a 9-ton road may become a 7-ton road for a few weeks until the roadbed dries and returns to its normal load-bearing capacity.

# Roads & Loads

## *Finding a Balance*



*This brochure is an educational supplement to a DVD which is available by request at:*

[www.lrrb.org](http://www.lrrb.org)  
or  
651-282-2272



## How Are Roads Designed?

Today, roadways are designed using engineering factors that establish the quantity, type and thickness of material that needs to be used to balance vehicle loads and roadway use.

Among other factors, current pavement design considers the amount, type and weight of the traffic using the road. This data is used to calculate an ESAL (equivalent single-axle load) factor; this factor is a way of measuring the impact that a vehicle will have on a pavement.

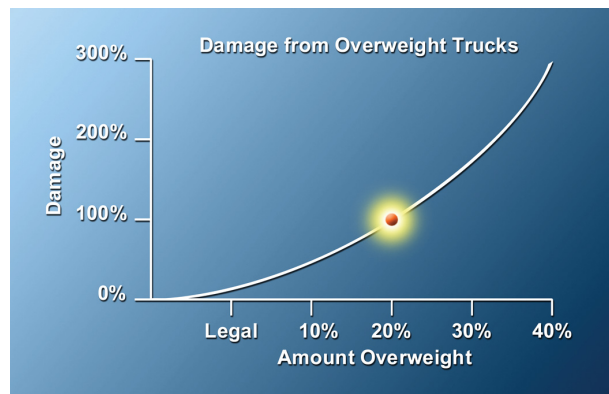
Pavements can be viewed as a “consumable” and are designed to carry an estimated number of ESALs over their design life. As each vehicle passes over a pavement, a portion of its life (the vehicle’s ESAL factor) is consumed.

Eventually, a pavement’s life is expended, and it needs to be reconstructed.

## What Happens When Actual Traffic Exceeds the Roadway Design?

Engineers forecast the traffic that will travel over a roadway during its design life. This traffic is then used to calculate a design ESAL. If the actual traffic volume and/or vehicle weights exceed forecasts, the roadway’s “actual” life will be less than its design life. Over the past decades, both traffic volumes and vehicle weights have increased dramatically.

If vehicles are overloaded, the damage to the pavement is severe and exponential. As shown below, if all vehicles were 20% overweight, pavement life is cut in half.



## Why Do We Have Truck Weight Limits?

Truck weight limits are set to protect our significant investment in transportation infrastructure.



## How Are Weight Limits Measured?

Load limits apply to both axle weight and to gross (total) vehicle weight. For example, on a road posted to 9-tons, a vehicle can carry 18,000 pounds on a single axle. Load limits are also set based on gross vehicle weight (GVW). All interstates, and most US and state highways in Minnesota have a designated GVW of 80,000 pounds.

