

Living in the Yukon means that most of our consumer goods arrive by truck. If the highway is damaged, it could mean an interruption in the delivery of the items we depend on, from milk to fuel and everything in between. The Yukon Government has a responsibility to ensure the road surface is not damaged and that travellers can use the roads to get safely to their destinations.

### Why Do We Need Spring Weight Restrictions?

Spring weight restrictions are necessary to help protect highways from damage which can cause untimely and expensive delays for the transportation industry, and the public who rely on the road network. Weight restrictions also help to avoid higher road maintenance costs as well as vehicle wear and tear.

In order to minimize damage to road surfaces, axle weights must be reduced during the spring thaw period.

Damaged road surfaces cause delays and extra costs for highway maintenance and vehicle wear and tear.

### How Our Roads Are Constructed

How a road performs under truck traffic is a function of the way that the road was built and the materials used.

Roads are built by preparing and shaping a subgrade from the locally

available soil and adding base layers of high-strength granular material such as sand or gravel. Typically, local soils often contain a high proportion of silt, which results in lower strength.

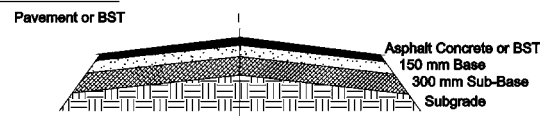
Nowadays, major Yukon highways, such as the Alaska Highway, are constructed with a substantial thickness of high strength granular material in the road's base layers.

These roads have a greater ability to support the wheel loads imposed by trucks.

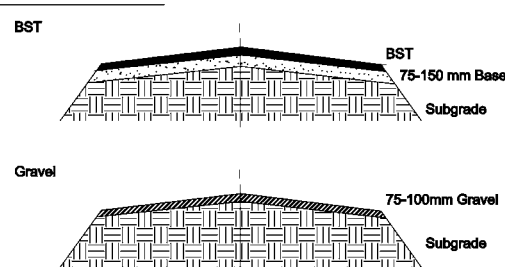
However, many of our older roads were constructed on soils containing high amounts of silt, which when wet, is much weaker than gravel or sand.

These roads contain little or no granular base material and as a result, are more susceptible to damage during the spring period.

#### Structural Roads



#### Non-Structural Roads



Note: BST stands for Bituminous Surface Treatment

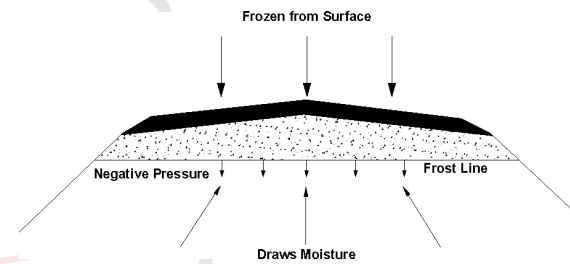
### What Happens to the Road?

Under freezing conditions silty soils attract water. The resulting high water content can cause the road to lose 50% to 70% of its strength during spring thaw and consequently the road surface is more likely to be damaged by heavy traffic.

When freezing temperatures occur, a number of events take place beneath the road surface, and the basic structure of the soil changes.

#### Freezing

As fall approaches, the road freezes from the surface downwards. A negative pressure develops at the advancing frost line. This draws water up from below, increasing the moisture content of the soil.

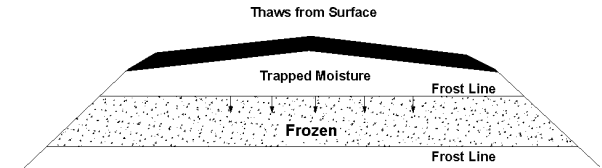


#### Thawing

During spring, as temperatures warm, the road thaws from the surface first, moving downwards.

As the frost line moves downward, the moisture is left behind, trapped directly below the road surface.

This trapped moisture has no place to move since it cannot escape through the frozen soil or the sealed road surface.

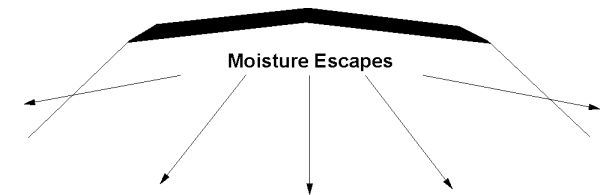


The relatively rigid road surface on top of soil containing trapped moisture has been compared to a sheet of glass on a waterbed, due to the high potential for damage from heavy traffic loads.

In fact, it has been observed that under certain conditions, a single truck can completely destroy a portion of road surface.

#### After Thaw

As the frost line moves further downward, the trapped water is finally able to escape, and the microscopic structure of the soil reverts to its original state and the soil strength increases.



## When to Impose Weight Restrictions

Weight restrictions are based on the thaw rates of the road structure measured by thermistors located throughout the highway system, and the observed condition of the road surface.

A thermistor is a type of thermometer that is capable of measuring temperatures at various depths in the road structure.

As the frost line moves deeper below the road surface, different weight restrictions are recommended until the frost line is deep enough for moisture to escape and the soil to regain its strength:

- 100% restrictions are imposed when ambient temperatures are such that surface thawing is present and roadway surfaces show signs of distress.
- On non-structural highways, 75% load restrictions are recommended when thermistor readings indicate thaw to 0.3 m below road surface.
- Removal of load restrictions below 100% is recommended when the thermistor readings indicate thaw to 1.0 m below the road surface.

- Removal of all load restrictions is recommended when the thermistor readings indicate thaw to 1.4 m below the road surface.

These recommendations are considered in conjunction with observed road surface conditions in making a decision when to impose or lift restrictions.

Full-strength structural roads such as the reconstructed Alaska Highway, the South Klondike Highway and the Haines Road are typically not restricted below 100% of legal axle weights.

### Historical Weight Restriction Dates

In order to accommodate the long-distance nature of heavy truck traffic travelling through Yukon, 48 hours notice is provided via internet, radio and fax before imposing weight restrictions

The tables below show the dates for recent years when different levels of axle weight restrictions have been earliest applied and latest taken off.

#### All Main Highways Except Top of the World (Hwy 9):

|      | 100% on | 75% on | 75% off | 100% off |
|------|---------|--------|---------|----------|
| 1998 | Mar 23  | Apr 2  | May 25  | Jun 3    |
| 1999 | Mar 25  | Apr 6  | May 14  | Jun 2    |
| 2000 | Mar 27  | Mar 31 | Jun 2   | Jun 12   |
| 2001 | Mar 30  | Apr 11 | May 11  | Jun 4    |

#### Top of the World Highway:

|      | 100% on | 75% on | 75% off | 100% off |
|------|---------|--------|---------|----------|
| 1998 | Mar 23  | Apr 30 | May 28  | Jun 3    |
| 1999 | Mar 25  | Apr 6  | Jun 2   | Jun 2    |
| 2000 | Mar 27  | May 14 | Jun 23  | Jun 23   |
| 2001 | Mar 30  | May 16 | Jun 22  | Jun 22   |

### For More Information

- Information regarding spring weight restrictions is available at our website:

[www.gov.yk.ca/roadreport](http://www.gov.yk.ca/roadreport)

(click the “*Weight Restrictions*” tabs on the left)

- Road reports are also broadcast daily on local radio stations.
- A fax notice service is also available during weight restriction season. Please contact 1-867-667-3710 to be included on the list.

Spring weight restrictions are not arbitrarily imposed, but rather are set based on actual scientific information and observed road conditions. We need your cooperation to ensure that people and goods can move safely over our highways without damaging the road surface.

# Yukon

## Spring Weight Restrictions

