



FROZEN ROAD DECLARATION, MID-SEASON THAW, ENDING THE DECLARATION, AND SPRING WEIGHT RESTRICTION DECISION PROCESS

Frozen Road Declaration:

State highways in Wisconsin are determined to be frozen at the start of the winter season when the frost has reached a depth of at least 18 inches below the pavement surface. The items listed in the resources section below are critical in making this determination. The average date for the beginning of the frozen road period (in 1 or more zones) is December 22nd.

The frozen road declaration is implemented according to State Statute 384.175 which says:

“On the first day that conditions warrant their determination of such frozen condition and freedom of damage to such highways by transportation, the officers or agencies in charge of maintenance of highways shall declare particular highways, or highways within areas of the state, as eligible for increased weight limitations, and each declaration shall be effective as of 12:01 a.m. on the 2nd day following the declaration.”

In order to determine when the roads are frozen we use a Frost Model that has been used successfully in Minnesota for the same purpose for many years. The model gives us estimated dates to when the roads will be frozen. Once estimated dates are established, frost tubes and Roadway Weather Information System (RWIS) station sensors are monitored, as well as visual observations to confirm that the roads are frozen at a depth of at least 18”.

The state is divided into zones so that the law can be implemented consistently. The five zones represent different and distinct climatological regions and correlate with historical declaration boundaries. A frozen road declaration will be issued for one or more of the zones once all the highways in the zone is determined to be frozen at a depth of at least 18”. The map at the end of this section shows graphically the area included in each zone. A narrative description of the limits of each zone follows:

Zone 1: Extends from the Minnesota border, Lake Superior, and the Michigan border south to and including US Highway 8.

Zone 2: Extends from the southern limit of Zone 1 to and including a line defined by US Highway 10, east on State Highway 73, east on State Highway 54, north on State Highway 22/110, east on State Highway 22 east to Lake Michigan east of Oconto (including Highways 10, 22, 54, 73, and 110).

Zone 3: Extends from the southern limit of Zone 2 to and including a line defined by US Highway 151, east on US Highway 10 to Lake Michigan (including Highways 10 and 151).

Zone 4: Extends from the southern limit of Zone 3 to and including a line defined by I-39/90 starting at the Illinois border, east on I-43, north on State Highway 164, east on State Highway 167 east to Lake Michigan (including Highways 39/90, 43, 164, and 167).

Zone 5: Extends from the southern limit of Zone 4 to the Illinois border and Lake Michigan.

Mid-Season Thaw:

Throughout the frozen road period, there may be periods of thawing when the ground immediately below the pavement structure is no longer frozen. During these periods, the pavement is more susceptible to damage due to freeze thaw cycles and saturated soils. In order to protect the pavement structure, the department may temporarily impose [spring weight restrictions](#). If this is warranted, the department will provide, at a minimum, the same notification period required at the start of the declaration.

Ending the Declaration:

At the end of the winter season, state highways in Wisconsin are determined to no longer be frozen when the thawing depth under the pavement surface reaches the subsoils. The average date for ending the frozen road period is March 4th. As with implementation of the frozen road period, the end of the frozen road declaration will occur on a zone-by-zone basis as the highways in each zone are determined to no longer be frozen. When the department determines the frozen road declaration should be ended, it will provide, at a minimum, the same notification period required at the start of the declaration.

The resources listed at the end of this section will be used to establish the appropriate date for ending the frozen road declaration in each zone, including the Frost Model, the RWIS sensors, frost tubes, and visual observations.

Spring Weight Restrictions:

During spring, thawing begins at the pavement surface and moves downward. This can mean that frost under the pavement surface may still extend down to a depth of 48 to 72 inches, while thawing immediately below the pavement structure has occurred. This condition creates many problems for the pavement structure. As this thawing occurs, the moisture cannot drain downward due to the frozen soil below. This trapped moisture in the soil created instability in the pavement structure. Also during this time period, air and pavement temperatures can fluctuate greatly between the daytime and nighttime hours. Daytime temperatures in the 20's and 30's with the sun shining on a asphaltic pavement surface can produce pavement temperatures in the 50's and cause thawing of the pavement and support system. During the nighttime hours, the roadway can refreeze due to lower temperatures. This daily "freeze-thaw

cycle” can also cause distress to the pavement.

Trapped moisture, the daily freeze thaw cycle and continuous oscillating movement of heavy trucks driving on it begins to crack and break down the pavement structure. For these reasons, spring seasonal weight restrictions are imposed on approximately [1,400 miles of State Highway](#) in the spring. The average date for imposing spring weight restrictions is March 9th. The average date for ending the spring weight restrictions is May 9th.

Resources:

The beginning and ending dates for the Frozen Road period and the Class II Road period (and suspension of divisible overweight permits) are determined by the Wisconsin Department of Transportation (WisDOT) Bureau of Highway Operations using the following resources:

1. Minnesota DOT frost model modified for use in Wisconsin.
2. Observations and engineering evaluation of current pavement conditions by the staff at the five WisDOT Regional Highway Operations offices. They travel on the state highway system on a daily basis and observe signs of the current pavement surface conditions that indicate whether the pavement is weakening during the spring thawing period or is gaining strength during the frozen road period.
3. Ninety-one (91) frost tubes installed in asphaltic pavements that are manually read for frost and thaw depths under the pavement surface.
4. The WisDOT Roadway Weather Information System (RWIS) which includes 65 roadside weather stations located throughout Wisconsin on the state highway system. Sensors at these weather stations record current air temperatures, pavement surface temperatures, and sub-surface temperatures at 18” below the surface of the pavement.
5. Infrared pavement temperature sensors that continuously record the temperature of the pavement surface in the vehicles used by the WisDOT Regional Highway Operations staff as they monitor the road conditions.
6. National Weather Service (NWS) 6-10 day and 10-14 day long range weather outlooks (available [here](#)).
7. Ten-day weather forecasts for individual Wisconsin cities available from the Maintenance Decision Support System (MDSS).

Contact Information:

Call (608) 266-8417 for a recorded message of the current status of the frozen road declaration.

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Questions about overweight/oversize permits:
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