



"Preserving Our Past, Enhancing Our Future"

It's Really True: Bridges Freeze before Roadways

Why it's prudent to slow down on bridges during winter

The Delaware River Joint Toll Bridge Commission urges motorists to exercise caution when crossing bridges impacted by precipitation and cooling temperatures. Why? Because a wet bridge will always freeze more quickly than its adjoining approach roadways.

While the Commission's maintenance crews strive to provide motorists with the safest driving conditions possible, winter weather events can cause patches of ice to form before work crews can apply road salt or ice-melting chemicals.

For this reason, motorists traveling in winter precipitation should always make it a practice to slow down whether travelling on any kind of road surface. This precaution is especially true for bridges because they always cool quicker than land-surface roadways.

Why do bridges freeze before a road?

The reason bridges freeze before other surfaces is basic physics. Four factors contribute to rapid icing conditions on bridges:

- Exposure of the structure to air from below and above
- The absence of soil that provides an insulating effect on non-bridge road surfaces
- The tendency of bridges to be situated over cold spots like rivers and deep ravines
- The use of construction materials like steel and concrete that do not retain heat

When freezing winds pass over and below a bridge, the structure loses heat from every side. Bridges inherently lack the ability to trap any heat, so they will freeze shortly after atmospheric temperatures hit the freezing point.

In contrast, most roads are made of asphalt, a material less-prone to heat loss. Roadways also can take advantage of the insulating and warming effects from the soil below them.

A good explanation of the bridge-freezing dynamic is available from two professors at the University of Wisconsin-Madison's Department of Atmospheric and Ocean Sciences:

<http://wxguys.ssec.wisc.edu/2011/02/28/why-do-bridges-ice-before-the-road/>